

FOR OFFICIAL USE ONLY

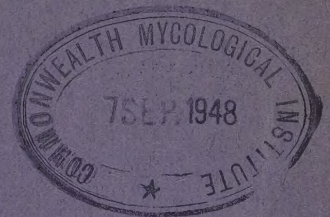
Vol. 18. No. 7. pp. 291-322
Abstracts 1251-1394

July, 1948



THE VETERINARY BULLETIN

1948



COMMONWEALTH BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net

Annual Subscription £2

Commonwealth Agricultural Bureaux.

EXECUTIVE COUNCIL

Lt.-Col. J. G. ROBERTSON, <i>Chairman</i> ... ..	... Canada.
Sir PATRICK R. LAIRD, C.B., F.R.S.E., <i>Vice-Chairman</i> ... ..	... United Kingdom.
J. E. CUMMINS ... ..	... Australia.
G. A. HOLMES, B.Sc., B.AGRIC. ... ..	... New Zealand.
A. P. VAN DER POST ... ..	... Union of South Africa.
J. W. DULANTY, C.B.E. (High Commissioner) ... ..	... Eire.
Col. W. F. RENDELL, C.B.E. ... ..	... Newfoundland.
R. S. MANI, I.C.S. (Officiating Deputy High Commissioner) ... ..	... India.
THE HIGH COMMISSIONER FOR PAKISTAN ... ..	... Pakistan.
B. O. BINNS, O.B.E., I.C.S. ... ..	... Burma.
W. V. D. PIERIS ... ..	... Ceylon.
A. V. HUBBARD ... ..	... Southern Rhodesia.
J. G. HIBBERT, M.C. ... ..	... Colonies, Protectorates and Mandated Territories.
Sir HERBERT HOWARD, 2, Queen Anne's Gate Buildings, London, S.W.1 ... ..	... <i>Secretary.</i>

COMMONWEALTH BUREAU OF ANIMAL HEALTH, WEYBRIDGE

*Director, Veterinary Laboratory, Ministry of Agriculture and
Fisheries, and Consultant Director of the Bureau :*

Professor T. DALLING, M.A., M.R.C.V.S.

*Director and Editor of
The Veterinary Bulletin and of Index Veterinarius :*

W. A. POOL, M.R.C.V.S.

Assistant Director :

M. CRAWFORD, M.R.C.V.S.

Scientific Assistants :

E. MARSH JONES, M.Sc., A.R.I.C.

E. V. LORD

F. A. ABBEY, B.A. (Cantab.), Dip. Forestry; Dip. Timber Tech.

Editorial Assistants :

PATRICIA F. STEVENS, B.A., B.Sc.

F. EILEEN WILLIAMS, B.A.

ABSTRACTORS CONTRIBUTING TO THIS ISSUE

UNITED KINGDOM

C. Aharoni.
Ruth Allcroft, B.Sc., PH.D.
K. A. Allen, INC. AGRIC. (PRAGUE).
J. D. Blaxland, M.R.C.V.S.
B. Cinader, B.Sc.
E. Cotchin, M.R.C.V.S.
A. T. Cowie, B.Sc., M.R.C.V.S.
L. Davies, B.Sc.
A. Eden, PH.D., M.A.
J. T. Edwards, M.R.C.V.S.
T. H. French, B.Sc., M.R.C.V.S.
S. J. Gilbert, M.R.C.V.S.
Pamela S. Gordon, M.A.
J. A. Griffiths, F.R.C.V.S.
C. Horton Smith, B.Sc., D.I.C.
J. Hosker, B.A.
A. R. Jennings, B.V.Sc., M.R.C.V.S.

Isobel W. Jennings, M.R.C.V.S.
S. B. Kendall, B.Sc., M.R.C.V.S.,
A.R.C.S.
E. Klieneberger-Nobel, PH.D.,
D.Sc.
E. Kodicek, M.D. (PRAGUE), PH.D.
R. M. Loosmore, B.V.Sc., M.R.C.V.S.
D. Luke, B.Sc., M.R.C.V.S.
R. Macgregor, F.R.C.V.S.
Rachel Marshall, PH.D.
U. F. Richardson, B.Sc., M.R.C.V.S.
J. M. Robson, D.Sc., M.D., F.R.S.E.
N. Saba, B.A. (CANTAB.).
R. Scarisbrick, B.A. (CANTAB.),
PH.D., M.R.C.V.S., A.R.I.C.
Kathleen J. Sinclair.
Beryl A. Thurston, B.Sc.
J. A. J. Venn, M.R.C.V.S., D.V.S.M.

A. G. Warren, M.R.C.V.S.
A. L. Wilson, M.R.C.V.S.

AUSTRALIA

D. C. Blood, B.V.Sc.
H. McL. Gordon, B.V.Sc.
D. Forsyth Stewart, B.V.Sc.
D. A. Titchen, B.V.Sc.

CANADA

R. Gwatkin, B.V.Sc.
P. J. G. Plummer, V.S., B.V.Sc.
Christine E. Rice.

INDIA

M. M. Huq, B.V.Sc.

PAKISTAN

F. C. Minett, D.Sc., M.R.C.V.S.

THE
VETERINARY BULLETIN

Vol. 18.]

July, 1948.

[No. 7.]

DISEASES CAUSED BY BACTERIA AND FUNGI

CECCARELLI, A. (1947.) Azione dell'acido ascorbico sul "*Bacillus anthracis*" in vivo e in vitro. [In vivo and in vitro action of ascorbic acid on *Bacillus anthracis*.]—*G. Batt. Immun.* 35. 401-412. [English, French & German summaries.] 1251

Controversial bibliographical evidence on the role of ascorbic acid in anthrax infection is reviewed. Experiments in rabbits inoculated with *B. anthracis*, some of which received vitamin C supplement, showed that the effectiveness of vitamin C lay in inhibitive action on the bacterium and not on an improvement of the animal's defence against the disease. The effect of vitamin C on rabbits infected with *B. anthracis* was nil.

—K. J. SINCLAIR.

BOGDANOV, N. N. (1939.) Deĭstvie in vitro zheludochnoy soderzhimovoy lozhadi na virus "antraksa". [The in vitro action of the stomach contents of the horse on anthrax spores.]—*Sborn. Trud. Kharkov. vet. Inst.* 18. No. 1. 63-68. [French summary.] 1252

The animals were deprived of food and water for 18 hours, then given five litres of oatmeal gruel. One and a half hours later the stomach contents were evacuated by means of a stomach tube attached to a Wolff's bottle and a vacuum pump. The material was coarsely filtered and then mixed with anthrax spore emulsion (five drops of emulsion to 5 ml. of stomach contents), and incubated at 37°C. At varying intervals of time samples were tested for virulence and examined microscopically. It was found that after six hours the spores became more oval and stained more intensely. After 24 hours typical bacillary forms and involution forms appeared, the latter predominating. The organisms were alive and virulent after 24 hours' incubation.

—I. W. JENNINGS.

DELPY, L. P., & KAWEH, M. (1946.) L'infection charbonneuse des animaux et de l'homme en Iran. Conditions de préparation et d'utilisation d'un vaccin sporulé et stabilisé. [Anthrax in

Persia, prophylaxis by a spore vaccine.]—*Arch. Inst. d'Hessarek.* 2. No. 4. 3-48. [In F.] 1253

It is stated that one of the chief problems of Persia is the loss caused by anthrax in sheep. There are about 15,000,000 sheep in the country, and in the absence of efficient control measures, the losses are about 1,000,000 animals a year. The sheep being nomadic it is impossible, in view of the numbers involved, for the herdsmen to dispose of carcasses when an outbreak occurs, so that immunization is the only practicable method of control. The nomadic conditions impose the necessity of a single inoculation with a vaccine of good keeping qualities, and the rough conditions and absence of fully trained staff require that the amount of the dose should not be too exact and that it should not matter whether it is introduced intradermally or subcutaneously.

Working with several strains of anthrax bacilli, it was found that the virulence of one of them to rabbits had become considerably reduced. This strain was remarkable for its rapid and regular sporulation, for its high virulence to g. pigs but not to rabbits or domestic animals. The fatal dose of this strain for g. pigs weighing 500 g. was ten living spores suspended in 1 ml. of glycerin-saline; though it is suggested that if one spore vegetated in the subcutaneous tissue it would cause a fatal infection. The minimal fatal dose for a rabbit was at least 1,000 times the fatal dose for a g. pig. The vaccinal dose for sheep was determined as 0.2 ml. of the standard saline-glycerin spore suspension diluted 1:200, and in testing lots of vaccine, two sheep were inoculated with 10,000 vaccinal doses, this causing only a febrile reaction lasting less than seven days. Cattle and goats behaved similarly to sheep, and even higher doses only caused local and febrile reactions in horses.

The strain sporulated rapidly and regularly at 35-36°C. on agar without peptone. If peptone was added secondary filamentous colonies appeared which died without producing spores. Details are given of the care required in the maintenance of

the strain, of the technique of the vaccine preparation, and the method used to determine the vaccinal dose.

The glycerin-saline suspension kept at about 4°C. in 100 ml. flasks retained its properties for at least two years, and when diluted and sent out in ampoules for use, is considered serviceable for a year.

The intensity of the febrile reaction produced by vaccination is not related to the doses injected, but varies with the animal, and animals inoculated with a large vaccinal dose may react more severely to an immunity test than those inoculated with less vaccine. An immunity sufficient to prevent any reaction to the injection of virulent material is never obtained, but this reaction does not cause any serious disturbance to health. Immunity appears four days after vaccination, and lasts more than a year.

Sheep in Persia carry infections of *Babesia ovis*, *Babesia motasi*, *Theileria ovis*, *Theileria recondita*, *Anaplasma ovis* and *Eperythrozoon ovis*. After vaccination the parasites may reappear in the blood, but this has equally been observed in control animals, and it is not thought that vaccination provokes a relapse to protozoa. It is noted that of the parasites mentioned, only *B. ovis* and *B. motasi* cause serious disease.

It was estimated that if 5-6 million sheep could be vaccinated annually losses from anthrax would be negligible. From 1931 to 1936 the number vaccinated rose from 21,000 to 1,402,000, and epizootics of anthrax remained frequent. From 1936 to 1942 the numbers vaccinated varied from 3,400,000 to 6,055,000 with the peak in 1938, and during this period no heavy losses were recorded. Owing to war conditions, the vaccinations dropped to 2,415,000 in 1943-44, and anthrax losses again became heavy, with a still greater rise in 1945.

The second part of the paper gives an account of human anthrax in Persia, it being pointed out that there was also an increase in human cases in 1944 and 1945, at the same time as the increase in ovine cases.—U. F. RICHARDSON.

COWDERY, J. S. (1947.) **Primary pulmonary anthrax with septicemia.**—*Arch. Path.* 43. 396-399. [Author's summary and comment copied verbatim.] 1254

Human anthrax is not rare in the United States. The recent public health survey from 1939 to 1943 shows a 16 per cent increase of cases of anthrax for the period. The infection occurred in people who had no occupational contact with infected material. One patient was a football player (soil?). Several patients were children; one of these, 10 years old, was resident in a mining location in a state where animal anthrax

had been unknown for ten years; this child died of a pulmonary and blood stream infection. Other patients were housewives. Some of these had been gardening; others contracted the disease from tooth brushes, shaving brushes and a fur coat. Many of these cases were the fatal pneumonic type.

No longer can physicians think of anthrax as a disease limited to a few industrial and agricultural areas. While Pennsylvania has had a large number of cases of anthrax annually because of its tanneries and woolen mills, the present case is a good example to prove that anthrax may occur anywhere.

The unusual picture which this case presented in the clinical findings, in the gross pathological findings and in the histologic observations seems to warrant this report.

LAMOUNIER, R. D., & HIPÓLITO, O. (1943.) Tuberculose aviária em Minas Gerais. [**Avian tuberculosis in Minas Gerais (Brazil).**]—*Bol. Minist. Agric. Rio de J.* 32. pp. 35-44. [Abst. from English summary.] 1255

The authors give details of 19 cases of avian tuberculosis 12 of which were in chickens, six in ducks and one in a turkey. Avian tuberculin gave accurate results in tests on these cases.—E. V. L.

SMITH, H. R. (1947.) **The tuberculin testing of poultry and swine in Illinois.**—*Iowa Vet.* 18. 20. 1256

A conventional note with no new information. The TB. incidence in pigs in Illinois is 7%. Conventional comments are made about control of the disease in poultry. Some figures are given of incidence in poultry.—J. D. BLAXLAND.

ARENA, A. R., & CUCCHIANI, R. (1944.) Investigación del bacilo de Koch en la leche de vacas tuberculino-positivas. [**Tubercle bacilli in milk.**]—*An. Cated. pat. clin. tuberc.* 5. 68. [Abst. from abst. in *Amer. Rev. Tuberc.* 53. No. 1. p. 17 of absts. (1946).] 1257

In tuberculin tests on 322 cows in Buenos Aires 30.7% reacted; microscopic examination and g. pig inoculation tests (one g. pig only for each sample) were done with milk from these cows and no tubercle bacilli were demonstrated. The authors, however, emphasize that more complete examinations might have revealed infection.

HAUDUROY, P., & ROSSET, W. (1947.) Culture des différentes variétés de mycobactéries en milieu de Dubos. [**Culture of Mycobacterium tuberculosis on Dubos medium.**]—*C.R. Soc. Biol., Paris.* 141. 169-170. 1258

The authors cultivated 30 pathogenic and 35 non-pathogenic strains of mycobacteria on the medium devised by Dubos which contains the wetting agent obtainable under the commercial

name of "tween 80". They describe in detail the growth of the various groups of strains, out of which only the avian tubercle bacillus grew with general heavy turbidity in 48 hours, while the human, bovine and murine strains developed more slowly and produced mostly granular cultures only.—E. KLIENEGER-NOBEL.

YEGIAN, D., & KURUNG, J. (1947.) **Morphology of the mycobacterium tuberculosis. A study of artifacts produced in smears.**—*Amer. Rev. Tuberc.* 56. 36-40. [Spanish summary, authors' summary copied *verbatim*.] 1259

The elimination of artifacts by proper staining solutions and by the avoidance of trauma in the preparation of the film greatly simplifies the study of the morphology of the tubercle bacillus. Rapidly growing tubercle bacilli are solidly stained by the Ziehl-Neelsen technique, attention being given to the composition and concentration of the dye. In older cultures the conditions for growth are unfavorable and the bacilli first become elongated and then granular. The granules represent morphological units of the bacillus and are readily differentiated from the artifacts.

NADAL, H. S. (1945.) **Problems bilogicos que aun plantea la bacteriologia de la tuberculosis. [Granules of M. Tuberculosis.]**—*Pbl. Inst. anti-tuberc.* "Francisco Moragas". 6. 73. [Abst. in *Amer. Rev. Tuberc.* 55. No. 2. p. 58 of absts. (1947), copied *verbatim*.] 1260

It is known that the inoculation of material free of acid-fast bacilli can cause tuberculosis in the animal. The only explanation is that *Mycobacterium tuberculosis* can, under certain circumstances, develop biochemical and morphological properties which are distinct from its bacillary acid-fast form. The author has succeeded in obtaining variations of the classic tubercle bacillus. These variations have been constant and distinct. They were obtained repeatedly in different series of experiments. With those forms Nadal could provoke by inoculation in a small number of animals typical tuberculosis with presence of acid-fast bacilli. The Koch-bacillus can exist in the tissues in the form of acid-fast or non-acid-fast granules (Ziehl-positive or Much-positive granules). These can separate from the body of the bacillus and live independently. Much-positive and Ziehl-positive granules are of the same structure but represent different phases of the metabolic development of the granules. The conception that the granular forms develop with the aging of the tubercle bacillus is erroneous. The author has succeeded to cultivate granules *in vitro*. The presence of granule-containing bacilli and free granules during the phase of proliferation

of the bacillus suggests a possible intervention of these structures in the generative mechanism of the tubercle bacillus. In the beginning of a new cleavage phase the bacilli show one or several granules in their bodies. The acid-fastness of the bacilli and granules depends on the number of passages of the strain in the same medium. The more often it has been passed the higher the number of acid-fast elements. The granules begin to overlap the stroma. The stroma becomes less acid-fast and finally disappears. At this moment the granules become free. The isolated granules have a cocco-bacillary appearance and show all phases of their transition. These cocco-bacilli develop into bacilli of different lengths which are strongly acid-fast. This development shows that the granules are pre-bacillary forms which finally become homogenous in acid-fastness and morphology. The distinct biochemical behavior of the bacilli to the Ziehl-Neelsen stain corresponds to different periods of enzymatic adaptation of *Mycobacterium tuberculosis* towards different proteins. The granules never change in character in the same strain. The tubercle bacillus forms granules only when the defense mechanisms of the body increase and create unfavorable conditions for the bacillus. That is why granular forms are found in patients who show clinical improvement. Amongst 100 patients the appearance of granular forms was accompanied by clinical improvement in 75. At the same time the acid-fastness of the bacilli diminished. In the Ziehl-Neelsen stain, they showed only pink coloration. As the acid-fastness depends on the lipid contents of the body of the bacillus the appearance of the granules must be connected with some lipolytic action. When the blood lipase was increased and the patient showed clinical improvement, granule-containing bacilli appeared in the sputum. The action of the blood lipase and of pleural exudates on colonies of tubercle bacilli has been studied. The acid-fastness of so treated cultures diminished or disappeared completely. A totally different form of granules is observed in aged cultures which is distinguished from young granules by the absence of the bipolar form.

IZZO, R. A., & CICARDO, V. H. (1947.) **Effect of thyroid on experimental tuberculosis.**—*Amer. Rev. Tuberc.* 56. 52-58. [Spanish summary. Authors' summary copied *verbatim*.] 1261

Removal of the thyroid gland in guinea pigs causes a greater susceptibility to experimental tuberculosis. Thyroxin injections administered before or simultaneously with inoculation of tubercle bacilli prolong the period of survival of guinea pigs. The greater resistance to tubercu-

losis of animals with hyperthyroidism might be due to increased immunity, attributable to the effects of the glandular secretions.

GREY, C. G. (1947.) **Penicillin in the treatment of *Erysipelothrix rhusiopathiae*-infected turkeys.**—*Vet. Med.* **42**. 177-178. 1262

E. rhusiopathiae infection of maturing turkeys has been recognized in the U.S.A. since 1934: a summary of the disease which is accompanied by a high mortality, is given. Injection of 5 ml. of a turkey strain culture of *E. rhusiopathiae* led to infection and death. Penicillin (20,000 units per dose suspended in oil) injected into the wattles 24 hours after this inoculation reduced mortality to 1 in 10 when repeated four times at 24-hour intervals. A smaller number of doses, oral administration, higher dosage rates for less time, or two doses intramuscularly were all less effective. Swine erysipelas antiserum administered 24 hours after exposure protected only half the birds.

—R. SCARISBRICK.

CAMERON, H. S. (1947.) **Mouse protection with porcine gamma globulin against *Erysipelothrix rhusiopathiae*.**—*Cornell Vet.* **37**. 336-341. 1263

Using gamma globulin prepared from a pooled plasma fraction collected from 400 normal pigs, Cameron demonstrated complete protection in 12 mice inoculated simultaneously with 13-33 mg. of the fraction and 0.5 ml. of a suspension of a 48-hour growth of *E. rhusiopathiae*. Nine control mice inoculated with culture only, died in 48 hours. In view of the wide distribution of *E. rhusiopathiae* and the natural or acquired immunity in many hosts there is reason to believe that a concentration of antibodies may be present in the gamma globulin fraction of normal swine. Mice injected with 25 mg. of gamma globulin were divided into three groups of 8, 14 and 8, and infected with 0.5 ml. of 48-hour culture 7, 14 and 21 days respectively after primary injection. Protection was complete at seven days, almost complete at 14 days and absent at 21 days. Control mice all died in 48 hours.

No evidence of active immunity was found when mice injected with 0.5 ml. culture and 25 mg. gamma globulin simultaneously, were injected with a further dose of culture at intervals up to 28 days afterwards.—J. A. J. VENN.

WRAMBY, G. O. (1944.) **Om *Listerella monocytogenes* bakteriologi och om förekomst av listerellainfektion hos djur. [*Erysipelothrix* (*Listeria*) *monocytogenes* and its occurrence in animals.]**—*Skand. VetTidskr.* **34**. 277-290. [Abst. from English summary.] 1264

An account of the antigenic structure of *Erysipelothrix* is given. *E. monocytogenes* infection was demonstrated as the cause of disease in the

female genitalia of five rabbits, one hare and a g. pig. W. considers that insufficient attention has so far been given to metritis in rodents. The infection is commoner in cattle and is more frequent in cases of abortion than was previously known. It was isolated in pure culture from two quarters in a case of acute mastitis. Experiments are being carried out to determine its resistance in NaCl solutions of varying concentration. A short account of the bacteriological and pathological-anatomical findings in this infection in various animals is given.—E. V. L.

BORMAN, E. K., STUART, C. A., & WHEELER, K. M. (1944.) **Taxonomy of the Family Enterobacteriaceae.**—*J. Bact.* **48**. 351-367. 1265

The authors present a new classification of the family *Enterobacteriaceae* for the simplification of laboratory identification. The basis is the conception of the whole family as being phylogenically related organisms in a constant state of flux, recognizable "way-stations" in the passage from commensal to parasitic existence being stable types classified as *genera* with many unclassifiable transitional types.

The primary division is into chromogenic and non-chromogenic types, the old tribe *Serrateae* becoming the genus *Serratia*.

The non-chromogenic species are now divided into the following genera. Genus *Colobactrum*, which includes all rapid lactose fermenters, and contains all the organisms now loosely described as "coliforms". The genus *Proteus*, which includes all non-lactose fermenting organisms which decompose urea within 48 hours. The genus *Salmonella* and the genus *Shigella* are distinguished from *Proteus* by their inability to decompose urea, and from each other on serological grounds. The genus *Shigella* contains only those non-lactose fermenting *Shigella* organisms causing dysentery in man. The genus *Eberthella* is abolished, *E. typhosa* and *E. gallinarum* being included in the genus *Salmonella*. In the genus *Paracolobactrum* are included all organisms characterized by delayed lactose fermentation. The genus *Erwinea* is the same as the present tribe *Erwineae*. The genus *Proshigella* is the receptacle for forms not conforming to narrower categories. Glucose is fermented anaerogenically and lactose may or may not be fermented. It will be seen that the remnants of the present genera *Shigella* and *Eberthella* come within this genus, and include such organisms as *Shigella sonnei*, *Shigella dispar* and *Shigella equirulis*. In the authors' concept of the family, this genus contains the transitional forms.

The subdivision of the above genera into species is simplified to a great degree, and the

authors appeal for the retention of this specification with, where necessary, fully descriptive varietal names.—R. M. LOOSMORE.

SUTHERLAND, A. K. (1947.) **Contagious pneumonia and paratyphoid of pigs.**—*Qd agric. J.* 64. 103–107. 1266

No new material is presented in this article. A description is given of the three clinical syndromes occurring with *Salmonella cholerae-suis* infection and the common diseases with which they are likely to be confused. Suitable methods of control are described.—D. C. BLOOD.

JOSLAND, S. W. (1947.) **Salmonellosis of swine in New Zealand.**—*Aust. vet. J.* 23. 292–293. 1267

S. cholerae-suis was isolated from the organs of pigs dead from infectious enteritis in 23 different widely separated outbreaks. The New Zealand strains were shown on biochemical and serological grounds to be diphasic in contrast to the findings in America and Australia. The methods of isolation and identification of the strains are described.—D. F. STEWART.

SHELUBSKY, M., & OLITZKI, L. (1947.) **Separation and concentration of a thermolabile precipitinogen from *Shigella dysenteriae* (Shiga).**—*J. Hyg., Camb.* 45. 123–127. [Authors' conclusions copied *verbatim*.] 1268

Shigella dysenteriae (Shiga) contains a labile antigen which can be removed from the bacteria by extraction with urea directly or more completely by urea extraction following chloroform treatment. Labilotrop antibodies were produced when rabbits were immunized with the urea extracts or with chloroform-treated bacteria. The labile antigen in urea extract could be further concentrated by precipitation with alcohol or ammonium sulphate.

HAYES, W. (1947.) **The nature of somatic phase variation and its importance in the serological standardization of O-suspensions of salmonellas for use in the Widal Reaction.**—*J. Hyg., Camb.* 45. 111–117. [Author's summary copied *verbatim*.] 1269

Phase variation of the somatic antigen I in *Bact. paratyphosum* A and of the component XII₂ in *Bact. typhosum* and British strains of *Bact. enteritidis* has been confirmed.

Strains of *Bact. enteritidis* isolated in India by blood culture from cases of invasive disease in man fall into two serological types, neither of which undergoes demonstrable somatic phase variation. The probable mechanism of this type of variation is discussed in the light of experimental findings. The effect which phase variation may have on the clarity of end-points in agglutinin titrations and on the serological standardization of *Salmonella* O-suspensions is demonstrated.

The variation is briefly discussed from the points of view of *Salmonella* phylogeny and of human *Salmonella* infection.

GARRARD, E. H., McDERMOTT, L. A., BURTON, W. H., & CARPENTER, J. A. (1946.) **Non-specific pullorum agglutination reactions. I. Preliminary observations on fowl exhibiting non-specific reactions over an extended period.**—*Canad. J. comp. Med.* 10. 342–347. [French summary.] 1270

GARRARD, E. H., BURTON, W. H., CARPENTER, J. A., & McDERMOTT, L. A. (1947.) **Non-specific pullorum agglutination reactions. II. Post mortem studies on fowl exhibiting non-specific reactions over an extended period.**—*Ibid.* 11. 102–107. 1271

I. The sera of many birds gave atypical or non-specific reactions during routine testing work, with both variant and standard antigens. The reaction consisted of loose, fine flocculation which was easily disturbed and when once disturbed difficult to differentiate from true pullorum agglutination. Somewhat similar results were noted with a stained, polyvalent antigen in whole blood testing. The reactions were mostly encountered in certain pens and flocks, although a few were found in the most flocks tested. P.M. examination of 87 of these birds showed abnormalities in 78%. *Salmonella pullorum* was only recovered from seven birds. Many strains of staphylococci, enterococci and coliform types were isolated. No true agglutination was encountered in 96 such birds held for ten months. Some gave strong non-specific reactions up to 1:80 in October. Twelve of these birds were examined and nine showed some abnormality, as an enlarged liver, fluid in body cavity, inactive ovary, ruptured and discoloured ova. *S. pullorum* was not recovered from any, but 11 strains of staphylococci and coliform organisms were isolated.—R. GWATKIN.

II. The number of reactions increased over a period of 12–14 months as the autumn and winter season advanced, especially with variant form antigens. Some pathological condition was demonstrated in 60% of the 82 birds examined, the majority occurring in the ovary. Over 200 cultures from different organs were classified into Gram-positive cocci, coliform and miscellaneous groups. Most of the cocci were from ovary and liver. Many representatives of each group were agglutinated by pullorum and polyvalent *Salmonella* sera. Attempts to correlate the results were not successful, but there were indications that many of the organisms isolated might be partly responsible for non-specific agglutination reactions.—R. GWATKIN.

BERTHELON, M. (1944.) *La prophylaxie des*

brucelloses animales. [Prophylaxis of brucella infection in animals.]-*Rev. Path. comp.* **44**. 50-59. 1272

A conventional article with no new information. It deals with the methods in use in France.

—S. J. GILBERT.

MOORE, T. (1947.) A survey of buffalo and elk herds to determine the extent of brucella infection.—*Canad. J. comp. Med.* **11**. 131. 1273

During the winter of 1946-47, when a considerable number of the elk and bison in two of the National Parks in the Province of Alberta were being slaughtered as part of a programme of their reduction, an excellent opportunity was afforded for a serological survey of the incidence of *Brucella* infection in these animals. M. reports the results of agglutination tests of 186 elk and 37 bison sera. All of the elk sera were negative. Six of the bison sera were positive (five of the six were males), five gave doubtful reactions, and 26 were negative. The elk and bison roamed in different parks.—C. E. RICE.

ORAZIO, C. (1946.) Lesioni da brucella. [Brucella lesions.]-*G. Batt. Immun.* **34**. 385-434. [French, English & German summaries.] 1274

O. undertook experimental work involving the inoculation of g. pigs and observations on *Br. abortus* and *Br. melitensis* infection in human beings, describing the results in considerable detail. He described the reaction to infection in g. pigs in general terms as, initially, intense vasodilatation of the affected tissue, followed by proliferative changes involving the reticulo-endothelial system, with giant cell and epithelioid cell formation and fibroblast production and resultant changes.—K. J. SINCLAIR.

PARNAS, J. (1945.) Szczepionka bilowana przeciw Brucellozie. [A *Brucella abortus* bile vaccine.]-*Med. Wet.* **1**. 193-196. [Abst. from French summary.] 1275

P. speaks of immunological relationships between TB. and brucellosis and states that for this reason he used the Calmette-Guerin method of vaccine production on brucella. During the war calves were vaccinated against brucellosis in Germany by a bile vaccine prepared by the Behring Institute. By 202 passages of a virulent strain of "Brb/w" brucella on bile a strain "Brb/202" was obtained, which was avirulent.

—J. H.

SCHMID, G. (1947.) Beobachtungen über die Buck-Impfung in einem Bestande des schweizerischen Mittellandes während den Jahren 1943-1947. [Inoculation with strain 19 vaccine in a herd in Central Switzerland, 1943-1947.]-*Schweiz. Arch. Tierheilk.* **89**. 468-476. 1276

Vaccination of all young stock between five

and 24 months was initiated in 1943 in a herd of 316 cattle of which 24% had a positive titre. The vaccine was prepared according to the instructions of the U.S. B.A.I.; two injections of 10 ml. were given, the interval between injections being 2-3 weeks. Vaccinated and infected cattle were not separated in order to test the vaccine under conditions of permanent, although decreasing reinfection.

206 normal calves were produced during the following three years by the vaccinated animals; one stillbirth and three abortions due to *Br. abortus* occurred. 80% of the animals vaccinated at the age of 5-12 months during 1943 had a negative titre two years later, but only 51% of those vaccinated between 13 and 24 months. Due to gradual natural elimination of the infected adult animals the risk of infection decreased gradually, and so only 7% of the animals vaccinated from 1944 onward had a titre of 180 or above two years later; none had such a titre after three years.

Four among the vaccinated animals showed a definite rise in titre after 2-4 years; this was thought to be due to subsequent reinfection, although no actual abortion occurred.

In 1947 the whey titre of 23 cows whose blood serum titre varied from 1:20 to 1:5,120 was examined. In three of them the milk titre was 1:40, in one 1:20, and in all the others it was negative at 1:10. From 15 of these cows g. pigs were inoculated with milk; only one case was positive (blood titre 1:1,280, milk titre 1:20).

Strict separation of vaccinated from infected animals is recommended for commercial herds.

—C. AHARONI.

PILLEMER, L., WITTLER, R., & GROSSBERG, D. B. (1946.) The isolation and crystallization of tetanal toxin.—*Science*. **103**. 615-616. 1277

A seven-stage process is summarized of low temperature fractionation with methanol under controlled conditions of ionic strength and pH, using toxic protein from the filtrates of a culture of *Clostridium tetani* on a synthetic medium (Mueller and Miller). Crystallization is finally carried out at -8°C.; crystals dissociate at -5°C. A sketch of the crystals is given. No immunological data are presented. The final preparation has 3,500-4,000 Lf units and 50,000,000 to 75,000,000 M.L.D. per mg. N.

—B. CINADER.

MOULE, G. R., & SUTHERLAND, A. K. (1947.) Mycotic dermatitis of cattle.—*Aust. vet. J.* **23**. 95-97. 1278

Actinomyces dermatonomus [Bull (1923), *Aust. J. exp. Biol. med. Sci.* **6**. 301] was found in skin lesions in Queensland on six occasions in young male and female beef and dairy cattle which

had reached sexual maturity, the disease having occurred under all climatic conditions. Lesions occurred all over the body and legs and consisted of horny, brown or cream scabs 1 inch in diameter and $\frac{1}{2}$ inch thick with much exudate and a moist raw surface beneath. Only badly affected animals showed any systemic effects and they gradually lost condition. The scabs mat the hair and in bad cases may cover large areas with a solid plaque.

See also absts. 1302 (fungus antigens); 1327 (bacteriology of thrush in horses); 1330 (*Shigella* in dogs); 1342, 1343 (mastitis therapy); 1345 (antibiotics); 1347 (streptomycin in TB.); 1348 (streptomycin in pullorum disease); 1377 (tubercle bacilli in milk); 1378 (TB. in meat at abattoirs); 1392 (annual report Trinidad).

—D. C. BLOOD.

DISEASES CAUSED BY PROTOZOAN PARASITES

VAN DEN BERGHE, L. (1946.) A cytochemical study of the "volutin granules" [accumulated ribonucleic acid] in protozoa [*Trypanosoma evansi* and *Trypanosoma gambiense*].—*J. Parasit.* 32. 465-466. 1279

It has been demonstrated that the "volutin granules" of the cytoplasm of *T. evansi* and *T. gambiense* disappear after the action of ribonuclease. By the use of less active ferment, and by varying the degree of digestion, the granules are gradually reduced in size, suggesting that the disappearance of the staining is related to a progressive destruction of ribonucleic acid. Volutin granules in the haemogregarines of the frog react in the same way. It is therefore concluded that volutin granules are the site of accumulated ribonucleic acid. They may be exclusively constituted by that chemical substance, but at present it is only proposed that the appearance and staining properties of the granules are due to the presence of ribonucleic acid.—U. F. R.

MOLOMUT, N. (1947.) Mechanism responsible for lowered resistance of hypophysectomized rats to *T. lewisi*.—*J. Immunol.* 56. 139-141. 1280

Hypophysectomized rats and normal controls were inoculated with *T. lewisi*; during the first days of infestation the trypanosomes were counted in 50 fields of smears taken from the tip of the tail, and on the fourth day all rats were exsanguinated by cardiac puncture, and the blood sugar content determined. Whilst there was no marked difference in the trypanosome numbers, the percentage of blood sugar in the hypophysectomized group varied from 10-75, but in the normal controls it varied from 84-115. It is suggested that the lowered resistance of the hypophysectomized animals was due to the difficulty in maintaining metabolic functions to compensate for the demands of the trypanosomes for carbohydrate, the immediate cause of death in hypophysectomized animals being hypoglycaemic shock.

—U. F. RICHARDSON.

In one herd the occurrence of the first lesions on the rump and at the base of the tail suggested that injuries due to service may have provided the portal of infection. Diagnosis is based on the characteristic scabs and the presence of the Gram-positive mycelia and spores in smears. No treatment was attempted but it was noted that 0.2% sodium arsenate solution had no effect on lesions.

TENDEIRO, J. (1946.) O "anaplasma marginale" Theiler 1910 na Guiné portuguesa. [Anaplasmosis in Portuguese Guinea].—*Rev. Med. vet., Lisboa.* 41. 146-183. 1281

Anaplasmosis of cattle has been encountered in Portuguese Guinea in animals used for the preparation of anti-rinderpest serum. It is thought that the disease is endemic, the majority of animals being carriers of the parasite, and "premunized". Details are given of the leucocyte counts of two calves which appeared to show a pure infection with anaplasma, otherwise the article is mainly concerned with a review of the literature of the infection, dealing with the history, the morphology and differentiation of species of the organisms, distribution, pathology, diagnosis, treatment and immunization.—U. F. R.

CROSS, J. B. (1947.) A cytologic study of *Toxoplasma* with special reference to its effect on the host's cell.—*J. infect. Dis.* 80. 278-296. 1282

In investigating the morphological and biological characters of *Toxoplasma* two strains of human origin were used, being maintained in mice, which they both killed within a few days. Smears were made from the brain, spleen and liver of all animals used for transfer, and also from other organs. No dry smears were made. The smears were fixed in various fluids, and stained with Giemsa's stain, de Tomasi's modification of Feulgen's reaction and other methods.

Extracellular forms are described as usually somewhat almond shaped, but sometimes almost spheroidal, and sometimes crescentic. The lengths ranged from 2.7-6.4 μ , the large forms occurring intracellularly in large mononuclear leucocytes. Spherical forms were more common extracellularly, but did not occur in all smears and may represent a passing stage in the life cycle. About 50 flagellated protozoa were seen in three slides, both elongate and spherical individuals, but it is uncertain whether these represent a transitory stage or whether they were contamin-

ants. A shadowy thickened band of cytoplasm which divides the parasites longitudinally is described, being called a "cytostyle", as it is similar to but not identical with the axostyle of other organisms. Another structure described as a "phlange" was detected in some organisms, and anterior projections were also encountered, it being suggested that they might represent a modification for attachment to the host cell. Tests for volutin were negative.

Contrary to earlier descriptions, no differences were discoverable in the incidence of parasitization of mononuclear cells, eosinophils or neutrophils. The parasites have an evident affinity for the cell nuclei leading to progressive dissolution of the latter, which may undergo lysis or be extruded accompanied by a small amount of cytoplasm.

It is suggested that the "pseudocyst" con-

See also absts. 1349, 1350 (trypanosomiasis therapy); 1352 (surra in India).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

ANON. (1947.) **The Cincinnati Meeting of the A.V.M.A. II. The campaign against foot and mouth disease.**—*Vet. Med.* 42. 402-405. 1283

This is a review of the progress made in the campaign against foot and mouth disease in Mexico. 10½ million dollars had been spent by the U.S.A. and a further 60 million were required for the year ending June 30th, 1948.

Resistance by owners to slaughter of their cattle was being dealt with by giving mules and steel ploughs to replace the slaughtered oxen and the traditional wooden ploughs.

The campaign had encountered many difficulties. Supplies of American equipment did not begin to arrive until six months after the outbreak had been reported owing to delay in providing financial supply. The equipment comprised such items as bulldozers, jeeps and power spraying disinfecting units, etc. More equipment was needed to cope with the task of burying 1,000,000 head of cattle. The wide area affected, namely some 30,000 square miles, and bad roads constituted a great obstacle. The average compensation paid has been about 49 dollars per head. An urgent problem is to find an outlet for surplus cattle in the uninfected area in northern Mexico. They normally go to the United States but such movement is now prohibited. There are some 9,000,000 cattle in this area of which 600,000 should be sold to prevent overstocking and possible starvation. It is planned to use 250 American and 250 Mexican veterinarians together with paymasters, valuers and lay inspectors. Beef canning has been started to dispose of surplus cattle in the uninfected area.

—M. C.

sists of a mass of parasites enclosed in the cell membrane, the staining of the cell nucleus being considerably diminished; the name "terminal colony" is suggested for this stage. Observations with Feulgen's reagent have demonstrated that the nucleus is vesicular, and multiplication is solely by longitudinal binary fission, both of which are characters occurring in protozoa. As Feulgen's reaction gives negative results in yeasts, the organism cannot be classified as a yeast, and it is suggested that it may be a flagellate.

A hypothetical life cycle of the parasite is outlined, Weinman's suggestion that the "terminal colony" may be a resistant stage finding some confirmation in that it requires a longer time for hydrolysis than the extracellular forms.

The article is illustrated with 52 scale drawings, but the flagellated forms are not shown.

—U. F. RICHARDSON.

AZZI, A. (1942.) Vaiolo (variola). [**Pox diseases.**] —*G. Batt. Immun.* 29. 463-495. 1284

This is a good review of the pox diseases of man, domestic animals and birds. The preparation of vaccine for immunization against smallpox is described using alternate passages through calves and rabbits. The pox diseases of cattle, sheep, goats, swine, horses, fowls, pigeons and canaries are dealt with, and reference is made to reports of pox in dogs, camels, buffaloes, monkeys and rabbits, but no definite information is available as to the nature of the infective agent in these latter animals. The article does not record any original work or observations.—U. F. RICHARDSON.

DONATIEN, A., LESTOQUARD, F., PLANTUREUX, E., & GAYOT, G. (1947.) Les varioles animales en Algérie. [**The pox diseases of animals in Algeria.**]—*Arch. Inst. Pasteur Algér.* 25. 62-70. 1285

The chief diseases are sheep-pox, cow-pox, swine-pox and fowl-pox.

Algerian sheep are not very susceptible to sheep-pox, but, as a result of starvation or bad weather, the disease becomes clinically obvious and may cause considerable mortality. The only feasible method of control is by vaccination, and the sensitized virus method of Bridré and Boquet is adopted. The preparation and testing of the vaccine are described in detail, and the importance of using the virus in the period of modifiable virulence is stressed.

Swine-pox occurs only from time to time, and is not of very great importance. Experiments with the viruses of sheep-pox and swine-pox have shown that pigs or sheep do not react to the

heterologous virus, and pigs cannot be actively or passively immunized against swine-pox with sheep-pox virus or antiserum.

Cow-pox is not rare. An account is given of the preparation and testing of vaccinia virus vaccine for human use.

Fowl-pox is a widespread and important disease. A glycerinized vaccine is widely used providing a solid immunity lasting for at least 18 months. There is no reference to camel-pox.

—E. COTCHIN.

SETH, S. C. (1946.) **Rinderpest pill vaccine.**—*Indian Fmg.* 7. 405–406. 1286

There are practical difficulties in the use of goat spleen tissue vaccine, such as its fragility, need for transporting apparatus and collecting animals for inoculation. Under a scheme financed by the Indian Council of Agricultural Research a vaccine is being produced in pill form, given by means of a special "pill-injector", carrying 30 pills and so designed that only one pill at a time is injected. An account is given of methods so far tried for preparing the pills; pills made with glucose and gum acacia as excipients are useful and they keep for about a month. Reactions are mild and immunity tests were satisfactory over at least seven months.—F. C. MINETT.

CHADHA, S. R. (1946.) **Milch buffaloes in Bombay.** [*Rinderpest.*]—*Indian Fmg.* 7. 420–421. 1287

Some 65,000 buffaloes are held in Bombay and suburbs under stall-feeding for local milk supply. To replace those going dry, the monthly requirement is about 6,000. Since during war not more than 2,000 could be brought for replacement, it was imperative to prevent loss from disease, of which the chief was rinderpest, and also to control slaughter of dry stock by organizing government salvage centres. Buffaloes coming into the salvage centres were tuberculin-tested and under government order all fresh buffaloes imported into the city were immunized with goat-tissue virus under serum cover, and then branded.

—F. C. MINETT.

DOYLE, T. M., & WRIGHT, E. C. (1947.) **Crystal violet swine fever vaccine.**—*Vet. J.* 103. 406–417. 1288

The authors report results of experiments with vaccine prepared from the defibrinated blood of S.F. infected animals. The blood is stored at -70°C . and to each 800 ml. of it is added 200 ml. of ethylene glycol containing 0.5 g. of crystal violet, and the mixture incubated for 14 days at 37°C .

It was found that vaccine stored in the dark at room temperature retained its potency for at least 248 days, it was also found that $3\frac{1}{2}$ years at 34°C . did not affect the potency.

Vaccinated pigs when exposed to contact with S.F. or when tested by virus inoculation possessed a solid immunity for 12 months. Attempts to reactivate the virus by inoculation of doses of the order of 10–20 times the normal dose failed. It was shown that unweaned pigs, if the progeny of either crystal violet immunized or susceptible sows, were protected by the vaccine. The dose of vaccine suggested is 10 ml. for adult stock and all pigs over 70 lb. weight, 5 ml. for pigs below that weight. It is reported that one pig, out of a batch of five that had been immunized with crystal violet vaccine and subsequently injected with virus, without any evidence of systemic reaction, infected an incontact susceptible pig.

Whilst the authors were able to immunize pigs infected with *S. cholerae suis* they suggest that the efficacy of the vaccine in these conditions can only be determined satisfactorily by work in the field.

The antigenicity of various strains of virus bears no direct relationship to their virulence except in so far as those of low virulence produced weak vaccines.

[For earlier work on crystal violet in Britain, see *V. B.* 12. 535 and 13. 320.]—J. A. J. VENN.

KIRK, H. (1947.) **Poliomyelitis and virus disease of dogs.**—*Vet. Rec.* 59. 574–575. 1289

An unusual epidemic of poliomyelitis in man occurred in England in 1947; at the same time there was a high incidence of nervous disease in dogs. K. suggests that possibly the two were connected. He bases his opinion on some similarity in the symptoms observed in dogs and man.

—M. C.

PUGH, L. P. (1947.) **Poliomyelitis and virus disease of dogs.** [*Correspondence.*]—*Vet. Rec.* 59. 644. 1290

P. refers to Kirk's suggestion that dogs may possibly be susceptible to the virus causing poliomyelitis in man and goes on to discuss the differentiation of the nervous form of distemper from what may be called canine epidemic encephalomyelitis and which P. maintains is probably due to a virus other than that which causes distemper. In chorea the essential lesion is demyelination and although there is no definite evidence that demyelination is caused by the direct action of a virus it is probable that virus infection may initiate conditions which terminate in demyelination. P. does not express any opinion on the question of the susceptibility of the dog to the human poliomyelitis virus.—M. C.

I. ASPLIN, F. D. (1947.) **Observations on the aetiology of lymphomatosis. I. Study on**

"Chick disease".—*J. comp. Path.* 57. 116–125. 1291

II. ASPLIN, F. D. (1947.) Observations on the aetiology of lymphomatosis. II. The association of "chick disease" virus with field cases of lymphomatosis.—*Ibid.* 57. 126–133. 1292

III. ASPLIN, F. D. (1947.) Observations on the aetiology of lymphomatosis. III. The development of lymphomatosis in chickens free of the "chick disease" virus.—*Ibid.* 57. 134–143. 1293

I. The name "chick disease" is applied to a virus infection in young chicks characterized by focal lesions in the liver and heart muscle [see *V. B.* 10. 40 and 16. 18]. The significance of the "chick disease" virus and its relationship to that of lymphomatosis is discussed.

From 1940 to 1946 the author examined 63 strains of "chick disease" virus. Fifty-four were obtained from fowl affected with lymphomatosis, four from adult fowl showing no evidence of lymphomatosis and five from young chickens showing lesions of chick disease. All 63 strains induced lesions in chicks similar to those described by Blakemore. In a series of experiments mortality was 9.1%. The visceral lesions disappeared within one month after infection, but the virus was demonstrated in the tissues of three out of ten birds examined 400 and 664 days after inoculation. The virus could not be detected in ducklings, rabbits, g. pigs or mice 14 days after injection.

"Chick disease" can readily be transmitted by parenteral inoculation. In addition virulent strains readily spread to healthy in-contact chicks. The results of hatching experiments with eggs from hens infected by intraperitoneal injection of virus indicate that egg transmission can take place. The virus can be detected in the faeces about 48 hours after inoculation, *i.e.*, about the same time as visceral lesions appear. Virus activity is rapidly lost in faeces kept at 33–35°F. and at brooder temperature (85°F.). Some inoculated chicks may continue to excrete virus in their faeces for many months.

No inclusion bodies have been demonstrated in tissues from infected chicks. All the strains studied failed to produce lesions on the chorio-allantoic membrane or to increase embryonic mortality significantly, but visceral lesions similar to those in growing chicks developed in the embryo. The extra-embryonic fluids are rich in virus.

The effects of heat, cold, antiseptics and desiccation on the survival of the virus were also studied.

Treatment with sulphathiazole, sulphamethazine and sulphadiazine was successful. This effect

was inhibited by *p*-aminobenzoic acid. Penicillin therapy was not successful.

It is emphasized that the data here presented cannot justifiably be applied to the control of lymphomatosis.

II. The author attempts to assess the frequency of "chick disease" virus in lymphomatous and in non-lymphomatous fowls. The effects of sulphadiazine on clinical lymphomatosis and the incidence of chick virus in sulphadiazine-treated birds were also studied.

In 1943 cases of lymphomatosis obtained from different parts of Britain were divided into two groups. One group of 67 birds was killed and the tissues examined for chick virus by chick inoculation tests. The "chick disease" virus was demonstrated in 26 (38.8%) of these birds. The second group of 22 cases of lymphomatosis was dosed for ten days with sulphadiazine. These birds were all negative to the chick inoculation test for "chick disease" virus.

Forty-one untreated birds were examined by the same methods; 14 of these were apparently healthy and 27 had conditions other than lymphomatosis. "Chick disease" virus was demonstrated in only two (4.9%) of these birds.

All birds in which "chick disease" virus was demonstrated also showed evidence of serum neutralizing antibody. Six out of 30 lymphomatous birds negative for "chick virus" possessed this serum neutralizing property. Of nine sulphadiazine-treated lymphomatous birds negative to the chick test five showed serum antibodies and four were negative. Seventeen (43.6%) out of 39 lymphomatous birds examined by both tests showed no evidence of "chick disease" virus.

The findings suggest that "chick disease" is due to a virus which appears to be widely distributed in Britain. Its pathogenicity is low and its exact relationship to typical lymphomatosis remains obscure.

III. Liver and nervous tissue suspensions (called Strain A) from a 51-day-old pullet showing typical neurolymphomatosis were inoculated intraperitoneally into 15 seven-day-old chicks. Six of these were killed during the second week and examined for evidence of "chick disease". Two serial passages of tissue suspensions from these birds failed to demonstrate any evidence of "chick disease" virus. Three of the nine survivors showed typical lesions of lymphomatosis at 50–160 days. No "chick disease" virus could be demonstrated in these birds.

Strain A infective material from one of the birds in the above experiment, killed when showing symptoms of lymphomatosis was inoculated into 80 seven-day-old chicks. These were divided into three groups. Group A was killed

at 14 days. No evidence of "chick disease" virus was found. Group B was fed 0.5% sulphadiazine in the mash for 28 days following inoculation. In this treated group 14 out of 32 subsequently showed evidence of lymphomatosis. In the untreated but inoculated control group C 13 out of 33 birds subsequently showed evidence of lymphomatosis. Uninoculated chicks in contact with Groups B and C also showed evidence of lymphomatosis (10.7% and 16.6% respectively). 791 chicks from the same strain were reared for other purposes during the experimental period and in none of these did any sign of lymphomatosis or "chick disease" appear.

Sixty-seven of the experimental birds were tested for the presence of "chick disease" virus. Of these 23 were classified as lymphomatous and 44 as non-lymphomatous. Chick virus was detected in one only of the latter group. This bird was killed at 302 days and had been treated with sulphadiazine. This infection may have been secondary.

In the sera of nine lymphomatous chickens significant levels of neutralizing antibodies were detected in one bird. Of 11 birds exposed to strain A virus but not showing evidence of lymphomatosis three possessed antibodies against "chick disease" virus.

No benefit could be detected following treatment with sulphadiazine in an outbreak of lymphomatosis in four-months-old chickens.

The evidence here presented while not conclusive tends to the view that the "chick disease" virus is distinct from that of lymphomatosis.

—D. LUKE.

KABAT, E. A., WOLF, A., & BEZER, A. (1947.) **The rapid production of acute disseminated encephalomyelitis in rhesus monkeys by injection of heterologous and homologous brain tissue with adjuvants.**—*J. exp. Med.* 85. 117–130. [Authors' summary copied *verbatim*.] 1294

A picture resembling acute disseminated encephalomyelitis in the human being has been regularly and rapidly produced in *rhesus* monkeys by injection of emulsions of adult rabbit and monkey brain administered with adjuvants. No lesions of the central nervous system resulted from injection of similar emulsions of fetal rabbit brain or adult rabbit lung.

A description of the gross and histological findings in the central nervous system is given and compared with features of human demyelinating disease. The experimental findings are in accord with the hypothesis that antibody to the injected brain emulsion reacts with the tissues of the nervous system of the animal to produce the pathological changes.

LAEMMERT, H. W., DE COSTRO FERRIERA, L., &

TAYLOR, R. M. (1946.) **An epidemiological study of jungle yellow fever in an endemic area in Brazil. Part II. Investigations of vertebrate hosts and arthropod vectors.**—*Amer. J. trop. Med.* 26. Suppl. pp. 23–69. 1295

The cyclic transmission of the yellow fever virus in the forests of the Iheus region of Brazil has been investigated. Forests over 75 years old, which had largely reverted to the climatic type were termed old type in contrast to the new-type forests. Yellow fever virus was found to be present in captured marmosets and in *haemagogus* mosquitoes. There was a positive correlation of immunity in marmosets with old-type forests, and there were more *haemagogus* mosquitoes in this type of forest.

The virus was found in the marmosets *Callithrix penicillata* and *Leontocebus chrysomelas* and in the mosquito *Haemagogus spegazzini*. Laboratory experiments showed that they were all capable of transmitting the virus. There was also a relationship between immunity in captured marmosets, the prevalence of *haemagogus* mosquitoes and immunity in the associated human population.

Haemagogus mosquitoes are more prevalent in old-type forests, and tend to feed in the upper vegetation during the brighter, warmer hours of the day. Marmosets are also arboreal in habit, but are more active during the early morning and late evening and rest in the high branches of trees during midday, a habit which would make them easy prey for the mosquitoes.

The marsupials *Metachinus nudicaudatus* and members of the genera *Marmosa* and *Caluromys* were shown to be susceptible to infection by the virus to some extent. These animals were rarely found infected in nature. Concerning the vectors of the virus, the only other natural vector, *Aedes leucocelaenus*, was present in such small numbers that it could not be an important vector in the Iheus region.

Yellow fever even in the so-called endemic regions, has the custom of migrating and shifting its location. The presence of immune reactors implies that at some time the virus has invaded that locality. The forests must of necessity be large enough to furnish sufficient non-immune primates. It is the mosquito, rather than the vertebrate which is the reservoir of the virus, but there is no information as to the life-span of these forest mosquitoes under natural conditions.

—BERYL A. THURSTON.

AZZI, A. (1943.) **Rickettsiosi. [Rickettsia infections.]**—*G. Batt. Immun.* 31. 254–301. 1296

This is a review of the information on rickettsial infections available up to 1943. It

covers epidemic and endemic typhus of man, trench fever, the human tick-borne rickettsial infections of North and South America, and North and South Africa, trachoma and *Blenorrhoea neonatorum*. It also deals very briefly with heart-water, the monocytic rickettsial infections of dogs, cattle and sheep, and the conjunctival infection of ruminants. Attention is also drawn to the occurrence of rickettsiae in the lice and mites of fowls, and the detection of a rickettsial infection in a peacock. The article contains no original observations.—U. F. RICHARDSON.

BABUDIERI, B. (1940.) La reazione di Weil-Felix nei cani di alcune città Italiane. [The

Weil-Felix reaction in dogs in certain Italian cities.]—*G. Batt. Immun.* 24. 677–686. [French and German summaries, abst. from English summary.] 1297

A search for the existence of agglutinins for *Proteus* OX₁₉ and the Kingsbury strain [*Proteus* XK] in the serum of 119 dogs from Rome, Mailand and Predappio. The result was positive in a high percentage of cases, particularly with the XK strain. B. discusses the significance of the results and considers the view not yet proved that there is in every case a relationship between a positive Weil-Felix reaction in the dog and an existing or past Rickettsia infection.—K. J. S.

See also absts. 1326 (equine infective anaemia); 1388 (foetal anomalies due to virus infection during pregnancy); 1392 (annual report Trinidad).

IMMUNITY

GAJSKIĬ, N. A. (1944.) Infektsiya i immunitet u zhivotnykh, zalezayushchikh v zimnyuyu spyachku. [Infection and immunity in hibernating animals.]—*Zh. Mikrobiol., Moscow*. No. 3. pp. 5–14. 1298

The lowered rate of metabolism during hibernation of the marmots *Citellus pygmaeus* and *Marmota sibirica* appears to be accompanied by a lowered titre of agglutinins and bacterio-lysins, thus increasing susceptibility to plague. This infection assumes a latent form during the hibernating period, becoming activated when metabolic process returns to the normal rate.—K. A. ALLEN.

III. Comparison on rabbits, guinea pigs and mice of the reactivity and toxicity of highly purified vaccine alone or in 1.5% Ca phosphate, 12% gum arabic or 25% gum arabic suspensions, showed that superiority of reaction and toxicity was exhibited by the vaccine in Ca phosphate.

BARR, M., & GLENNY, A. T. (1947.) The delayed immunity response.—*Lancet*. 253. 647–649. [Authors' summary copied *verbatim*.] 1301

Antitoxin-production in animals continues for months or years after the injection of the last specific stimulus.

The injection of a toxin or toxoid into a potentially immune animal may give rise to two types of response in the same animal, the secondary response being followed by a delayed response in the form of a slow rise in antitoxic titre 2–3 months after injection.

There is a definite relation between the percentage of tetanus or diphtheria antitoxin remaining in the blood of hyperimmunised horses about a year after their last injection and the number of immunisations the horses have undergone. One horse, 13 months after its last injection, showed an antitoxic titre 88% of that observed when injections ceased. This animal had been under hyperimmunisation to tetanus for about 5½ years.

HOWELL, A. (1947.) Studies of fungus antigens.

I. Quantitative studies of cross-reactions between histoplasmin and blastomycin in guinea pigs.—*Publ. Hlth Rep., Wash.* 62. 631–651. [Author's summary and conclusions copied *verbatim*.] 1302

Three lots of histoplasmin, five of blastomycin, and heat-killed antigens prepared from yeast cultures of *Histoplasma capsulatum* and *Blastomyces dermatitidis* have been tested on guinea pigs experimentally infected with *Histoplasma capsulatum* and *Blastomyces dermatitidis*.

BEILINSON, A. V., BOBKOVA, M. P., & SMOLINA, E. A. (1942.) Izuchenie vliyaniya adsorbentov i obvolakivayushchikh veshchestv na vremya poyavleniya i napryazhennost' immuniteta. II. [A study of the influence of adsorbents and enveloping substances on the time of appearance and extent of immunity. II.]—*Zh. Mikrobiol., Moscow*. No. 1–2. pp. 70–71. 1299

BEILINSON, A. V., & BOBKOVA, M. P. (1942.) Izuchenie vliyaniya adsorbentov i obvolakivayushchikh veshchestv na vremya poyavleniya i napryazhennost' immuniteta. [A study of the influence of adsorbents and enveloping substances on the time of appearance and extent of immunity. III.]—*Ibid.* No. 1–2. pp. 71–75. 1300

[Absts. in *Biol. Abstr.* Sect. F. 19. No. 7. p. 37, slightly amended. Signed: H. LEVERNE WILLIAMS.]

II. Using a colloid mill, emulsions of wax and oil in water may be prepared with any degree of dispersion. Adsorption of vaccine, on a wax dispersion is some function of the amount of wax and the degree of dispersion. Preliminary experiments show that a single injection into mice of vaccine in a wax emulsion is not as effective as triple vaccination.

It has been shown that—The number of experimentally infected guinea pigs which reacted to histoplasmin, blastomycin, or the heat-killed yeast-phase antigens depends upon the particular lot of antigen employed and upon the dilution of this particular lot; although antigens prepared from cultures of *Histoplasma capsulatum* or *Blastomyces dermatitidis* will give reactions in guinea pigs infected with either fungus, the percentage and size of these cross reactions are dependent upon the dosage of the particular antigen employed; if the critical *titers* of these antigens are determined, and if these concentra-

tions are used to study cross reactions, the degree of cross reaction between these antigens is small and the antigens are therefore relatively specific for guinea pigs experimentally infected with the homologous fungi; the level or degree of sensitivity of the animals employed to determine the *titer* of an antigen must be considered. That is, if the sensitivity level is low, a high concentration of the antigen will have to be used to elicit a reaction, and, therefore, a false impression of the critical *titer* of the antigen will be obtained. Such high concentrations of antigen will produce a high percentage of cross reactions.

See also absts. 1253 (anthrax); 1263 (swine erysipelas); 1268 (shigella antigens); 1269 (salmonella antigens); 1270, 1271 (*S. pullorum* agglutinins); 1275, 1276 (brucellosis); 1280 (trypanosomiasis); 1286 (rinderpest); 1288 (swine fever); 1346 (TB. antigens).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

WATERHOUSE, D. F. (1945.) *Studies of the physiology and toxicology of blowflies*. 10. A histochemical examination of the distribution of copper in *Lucilia cuprina*. 11. A quantitative investigation of the copper content of *Lucilia cuprina*.—*Bull. Coun. sci. industr. Res. Aust.* No. 191. pp. 39. 1303

Physiological and toxicological studies previously noted [V. B. 11. 371; 12. 32; and 13. 93] have been continued.

10. Copper was detected in larval tissues by staining sections with sodium diethyl-dithiocarbamate. Copper ingested with food was found in cells of the mid-gut and in the Malpighian tubules of fully-grown *Lucilia cuprina* larvae but nowhere else in the body. A concentration of 0.03% Cu in the food medium retarded the growth of larvae. Growth was inhibited by a concentration of 0.06% Cu. Copper was chosen for these studies because of its universal occurrence in plants and animals, and because its function in the organism is closely linked with that of iron.

11. Copper concentration was measured by means of a microchemical estimation depending upon an extraction with amyl acetate of the brownish-yellow copper carbamate formed by ionized copper in the presence of sodium diethyl-dithiocarbamate (CALLAN & HENDERSON, 1929). Copper concentration in eggs was 5.9 mg. % dry tissue, rose to 7.0 mg. in newly hatched larvae, declined in the rapidly growing larvae and rose again to 6.2 mg. in unfed adult flies.

—H. McL. GORDON.

HOPKINS, G. H. E. (1944.) *Notes on myiasis especially in Uganda*.—*E. Afr. med. J.* 21. 258–265. 1304

H. suggests a classification of myiasis based on the mode of parasitism, giving a list of the insects causing myiasis in human beings in Uganda.—L. DAVIES.

DE CASTRO, M. P., & PEREIRA, C. (1946.) Alimentação das proteroninfas de "*Boophilus* (*Uroboophilus*) *microplus* Can., 1888" (*Ixodidae*) com os restos necróticos da reação tissular do hospedeiro. [The feeding of *Boophilus* (*Uroboophilus*) *microplus* Can., 1888 (*Ixodidae*) on the necrotic remains of the tissue reaction of the host.].—*Arg. Inst. biol., S. Paulo*. 17. 149–162. [English summary.] 1305

In feeding the larvae of *B. microplus* on the ears of rabbits it was noticed that the ingesta was pale, almost white, in contrast to the blackish ingesta of other tick species. In an attempt to explain this peculiarity a histological study was made of the reaction of the ear tissue to tick bites. From this it is concluded that the tick bite results in an irritation causing an exudation into the layers of the epidermis, followed by the deposition of fibrin and necrosis of the skin elements. This inflammatory process is milder than that induced by other species of *Ixodidae* in which haemorrhagic areas are formed. It is claimed that the nymphs of *B. microplus* feed on necrotic debris.—U. F. RICHARDSON.

GARVEN, H. S. D. (1946.) *Demodex folliculorum* in the human nipple.—*Lancet*. 251. 44–47. [Author's summary copied *verbatim*.] 1306

In ten out of thirteen cases *Demodex folliculorum* has been found in the sebaceous glands of the human female nipple.

Evidence of a response to irritation by the parasites lying deep in the gland has been found in the presence of round-cell infiltrations. Its relevance as a factor in the incidence of sore nipples has been suggested.

GRZYCKI, S. (1945.) *Sarcoptes scabiei* var. *equi* u człowieka. [*Sarcoptes scabiei* var. *equi* in man.].—*Med. Wet.* 1. 226–228. [Abst. from French summary.] 1307

A conventional note on sulphur treatment of mange.—J. H.

CARTER, H. F., & D'ABRERA, V. ST. E. (1946.) **Some experiments on Toque monkeys with tyroglyphid mites.**—*Indian med. Gaz.* 81. 284–287. 1308

Three experiments on Toque monkeys with *Tyroglyphid* mites are described. In the first, introduction of about 200 mite eggs into the

See also absts. 1351 (sarcoptic mange); 1354 (D.D.T. and blowfly); 1355 (*Simulium*).

trachea of a monkey caused eosinophilia and spasmodic cough. In the second, 2 ml. of mite extract, subcutaneously, was associated with a sharp but transient rise in eosinophiles without any other symptom. In the third, subcutaneous injections of 5 ml. of extract in four doses were given to each of the monkeys involved in previous experiments without causing any ill effects.

—M. M. HUQ.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

—, (1944.) Soveshchanie po voprosam gel'mintologii pri Glavnom veterinarnom upravlenii NKZ SSSR. [Conference on control of helminths in the veterinary department of the Soviet Ministry of Agriculture.]—*Veterinariya, Moscow*. No. 4. pp. 13–16. 1309

This conference at Moscow was attended by workers from the principal helminthological and veterinary institutes and by veterinary practitioners, and was called to discuss how more effective control of helminth infestations could be established in view of the heavy losses which had occurred in recent years, particularly from *Dictyocaulus*.

In general the institute workers were inclined to blame the field workers for lack of enthusiasm in applying control measures, whilst the field workers complained that the anti-helminth drugs were often ineffective and sometimes dangerously toxic (carbon tetrachloride), that further information as to epidemiology and the best time for treatment was required, and that the recommendations in respect of frequent changes of pasture were often impracticable. It was suggested that helminthological specialists should be appointed to the various districts to co-ordinate the work of the two sections.—U. F. RICHARDSON.

SKRYABIN, K. I. (1944.) Likvidiruem nedostupimoe ostavanie gel'mintologicheskoi praktiki ot dostizhenii nauki. [Eliminating the gap between scientific achievements and practice in the control of helminths.]—*Veterinariya, Moscow*. No. 4. pp. 8–13. 1310

Although the maintenance of animals free from helminth infestation greatly increases their productivity, and methods for the control of many of these parasites have been developed, little attempt has been made, however, to apply these methods in the field.

A sketch is given of the principal functions of a helminthological institute, of the problems that have been solved, and the problems that still await solution. As regards application to the field, it is suggested that the standard qualification

required for veterinary surgeons should be raised as regards helminthology, that short intensive refresher courses should be provided, and that scientific teams should be sent by the institutes to outlying districts to demonstrate the practical application of the methods recommended.

—U. F. RICHARDSON.

KOCYLOWSKI, B. (1945.) Przyczynek do biologii wlośni w ustrojach ryb slodkowodnych. [The biology of *Trichinella* in the body of fresh water fish.]—*Med. Wet.* 1. 228–233. [Abst. from French summary.] 1311

Fish having ingested meat infected with *Trichinella* larvae were found to excrete the parasites in the faeces at the end of 4–5 days. No muscular encystment occurred. The actual time of excretion depends on the environmental temperature and in the alimentary tract of carp or pike it may live from 16–18 days; development under these conditions is confined to completing the capsule stage and to body growth, and lasts from 16–21 days. *Trichinella* larvae injected intra-muscularly remain localized at the site of injection undergoing no development.—J. H.

BOEV, S. N., & BONDAREVA, V. I. (1944.) Sezonnaya dinamika diktiokaulëza ovets na yugovostokey Kazakhstana. [Seasonal prevalence of *Dictyocaulus* infection of sheep in the South East Kazakhstan.]—*Veterinariya, Moscow*. No. 4. p. 20. 1312

It is pointed out that *Dictyocaulus* infection has a seasonal incidence which differs in the various areas of Russia owing to the varying climatic conditions. The following conclusions as to the seasonal incidence in sheep in Kazakhstan were reached after several years of investigation. In adult sheep the infection reaches its maximum at the end of the winter, or the beginning of spring, with a sharp fall in summer and autumn, but with poor pasture and few changes of grazing, severe infection may occur in summer and autumn in adults, and occasionally in lambs. Prophylactic treatment does not materially influence the decline in the severity of infection at the end of the spring

and in the summer. The decline of infection in summer is ascribed to better conditions and frequent changes of grazing, leading to an increased resistance of the host which assists in eliminating infection, and prevents fresh infection, or at any rate arrests its development. In winter the severe climate prevents fresh infection, and the increase of parasites at the end of winter and the beginning of spring is ascribed to a fall in the resistance of the sheep, this suggests that the larval forms of the parasites occur in sheep in a latent condition, in the imago stage. It is recommended that mass prophylactic dehelminthization should be carried out in the late winter or early spring, not in the late spring, as now practised. On farms where there is insufficient good pasture to allow frequent changes of grazing, treatment might also be required in summer. Mass diagnostic inspection should be carried out at the time of treatment, or a little before it. Strict attention should be paid to prophylactic changes of grazing in the first half of spring, and the second half of autumn.—U. F. RICHARDSON.

PETROV, A. M. (1944.) *Dinamika epizootii moniezioza i diktiokaulëza ovets, koz i krupnovõ rogatovo skota. [The prevalence of Moniezia and Dictyocaulus infestation of sheep, goats and cattle.]—Veterinariya, Moscow. No. 4. pp. 17-19.* 1313

Moniezia infection occurs entirely on pasture when ruminants are brought into contact with the intermediate hosts oribatid mites. The time required to develop to maturity in the intermediate host is 4-4½ months, and it may be longer in winter. Disease is only observed in young stock, though adults may harbour a few worms. The period from infection to the development of the mature worm is not more than two months, and symptoms of disease and worm eggs begin to appear in lambs 1½-2 months after going out to pasture, the disease may continue in a flock for 2½-3 months. It does not occur at other times of the year. Young animals should be treated 30-35 days after being put out to pasture, and a second treatment may be required during the next two months.

Dictyocaulus infection occurs almost entirely on pasture as in stalls the larvae are killed by urine.

In northern areas the larvae are killed by frost in winter, and in southern areas they are killed by heat in summer. Infection occurs during the whole pasturing period except in the South in mid-summer. In desert areas infection only

occurs during the rains. In lambs growth to the mature stage takes 29-75 days, and this stage may live 2-8½ months. Well fed sheep throw off infection in the winter, but poor sheep remain carriers. All lambs are free till turned out to pasture. The first disease is noticed 1-2½ months after pasturing. Infection declines in the summer but increases again in autumn. The control measures recommended are dehelminthization before putting out to pasture and again in the autumn, accompanied by regular changes of pasture. In desert areas the massive infection occurs in December with increasing disease from February to April. Lambs under one year remain free from infection. It is unnecessary to change grazing from April to November.

In cattle *Dictyocaulus* infection attacks young stock and is rare in adults. It is suggested that adult cattle become immune, as it has been noted that in enzootic areas, local animals remain healthy, but imported adults become infected. In calves the parasites become mature in 25-45 days, the first disease in calves appearing in the second half of June. It was thought that adults acted as carriers maintaining infection over the winter, but it has been shown that the worms only survive for seven weeks.

In March, 1943, investigations were carried out on farms on which massive *Dictyocaulus* infection had occurred in 1942. These investigations showed complete absence of larvae in experimental cattle in the spring. The first larvae began to appear in June in calves born in the current year. There was a sharp increase of infection in August. The first cases occurred in yearlings in August, but were not severe. In adults no excretion of larvae was detected from March to September.

It is concluded that it is not necessary, in cattle, to enforce control measures when the animals are first put on pasture, but they should be kept under observation, and when larvae begin to appear, treatment and periodic changes of pasture should be introduced.—U. F. RICHARDSON.

CASSAMAGNAGHI, A. (Junr.). (1946.) *Amidostomum anseris en anser anser domesticus. [Amidostomum anseris in Anser anser domesticus.]—Bol. mens. Direcc. Ganad. Montevideo. 29. 618-623.* 1314

C. notes the presence in Uruguay of the gizzard worm *Amidostomum anseris* in geese. He gives a short illustrated description of the parasite. —I. W. JENNINGS.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

IVY, A. C. (1947.) *Biology of Cancer.—Science. 106. 455-460.* 1315

This is a critical review with many references. J. draws attention to certain aspects of the problem,

for example, the use of hormone therapy in neoplasia of the chorion, the nutritional requirements of the new growth and the reasons for the natural resistance of certain tissues to neoplasia. He pleads for more attention to gastric cancer in man; the incidence, distribution and theories relating to its aetiology are discussed, and there is a suggestion that feeble carcinogens may occur in the diet, especially in heated fats.—A. R. J.

HOLMDAHL, D. E. (1942.) Beitrag zur Frage von der Teratogenese. Die morphogenetische Theorie. [Origin of teratoma. The morphogenetic theory.]—*Acta path. microbiol. scand.* 19. 603–620. 1316

H. draws a distinction in the Vertebrata between primary morphogenesis, or development from distinct germ-layers, and secondary morphogenesis, or development from the undifferentiated blastema of the primitive streak and tail-bud. Secondary morphogenesis is responsible for the hinder part of the body, and also a small median portion of the anterior part of the body; in these regions, particularly, misplaced “abgesprengt” cell-complexes may give rise to teratomas, and these are in fact the regions where teratomas are most often seen. These misplaced cells have the innate potencies of the undifferentiated blastemas from which they arise, and it is not necessary to postulate the action of an organizer in misplaced tissue influencing the surrounding tissue by induction, as in the “organizer theory” of the genesis of teratomas; the authors make adverse criticism of the latter theory.—E. COTCHIN.

BOTIJA, C. S. (1942.) Mielopoiesis cutánea autóctona en la piel del perro. (Mielocytoma promario de la piel del perro.) [Primary myelocytoma of the skin of the dog.]—*Trab. Inst. Biol. anim., Madrid.* 7. 208–222. 1317

This is a detailed and well-illustrated study of the cytology of ulcerating myelocytomata originating in the skin of two dogs. Examination of the blood and haemopoietic organs failed to show any changes which might be related to the neoplastic growth.—I. W. JENNINGS.

CHESNEY, R. W. L. (1947.) Some experiences with colchicine in the treatment of mammary tumours in the bitch.—*Vet. J.* 103. 387–390. 1318

C. records in a clinical article the treatment of canine mammary neoplasia with colchicine. The diagnosis of neoplasia was made by palpation and measurement. The dose of colchicine and the general reactions are given. It is C.'s opinion that this method of treatment is of value.

—A. R. JENNINGS.

LUCAM, F., TISSEUR, H., & SIMINTZIS, G. (1944.) Les branchiomes. [Branchioma.]—*Rev. Méd. vét., Lyon et Toulouse.* 95. 97–105. 1319

The authors give a brief review on the mode of formation of the branchiomata and the histology of these neoplasms, the malignancy of which is stressed. In a survey of the veterinary literature they collected six cases which occurred in horses and dogs. An additional case in a dog is described in some detail.—A. R. JENNINGS.

NUTRITIONAL AND METABOLIC DISORDERS

MAREK, J., WELLMANN, O., & URBÁNYI, L. (1944.) Beeinflussung des Stoffwechsels beim Kaninchen durch eine einseitig Ca-reiche bzw. eine P-reiche Fütterung. [Influence on rabbit metabolism of diets rich in calcium and phosphorus.]—*Arch. wiss. prakt. Tierheilk.* 79. 282–287. 1320

The authors studied the influence of feeding large doses of calcium and of phosphorus on the metabolism of these mineral constituents in the rabbit. Diets rich in phosphorus resulted in deposition of phosphorus combined with calcium, in bones, muscles and organs. The deleterious effect of excess phosphorus is dependent on the amount of calcium in the diet. When the calcium content was low, the danger of acidosis was increased. Calcium-rich diets produced an increase in the calcium, magnesium and phosphorus content of the body and an increase in the Ca : P ratio.—E. KODICEK.

COUCH, J. R., JAMES, L. E., & SHERWOOD, R. M. (1947.) The effect of different levels of mangan-

ese and different amounts of vitamin D in the diet of hens and of pullets.—*Poult. Sci.* 26. 30–37. 1321

The authors studied the effect of low, medium and adequate levels of manganese with an adequate amount of vitamin D, the effect of low, medium and adequate levels of vitamin D with a high level of manganese and the requirements for manganese and vitamin D of hens in the second year of production as compared with that of pullets in the first year of production. New Hampshire hens were used in these experiments, each group containing 21 birds. The egg production, eggshell quality, fertility and hatchability were observed. There appears to exist a supplementary relationship between manganese and vitamin D when an excess of the mineral was fed with a sub-optimum amount of the vitamin. Hens in the second year of egg production required more manganese and vitamin D than pullets in first year of production. The manganese requirement of hens rose from 41 to 71

parts per million of manganese for egg production. Similar amounts were needed for eggshell quality and hatchability. Hens needed more vitamin D (more than 76 A.O.A.C. chick units, the unit introduced by the Association of Official Agricultural Chemists, of vitamin D per 100 g. of diet) for egg production and hatchability, than pullets whose requirements were met by 38-76 units. Excess of manganese resulted in improved egg-shell quality even when low amounts of vitamin D were fed. The manganese content of egg yolk seemed to be related to the intake of manganese.

—E. KODICEK.

FOURNIER, L. L. (1946.) Hipovitaminosis B y D experimental en cerdos. [**Experimental hypovitaminosis B and D in swine.**]—*Rev. Fac. Agron. Vet., B. Aires.* 11. 239-244. [Abst. from English summary.] 1322

Vitamin B₁ deficiency in pigs is clinically similar to the deficiency in man and in fowls. A specific vitamin deficiency cannot be dissociated from a deficiency of vitamin B₂ complex because the lack of a constituent may produce symptoms

See also absts. 1251 (ascorbic acid); 1373 (vitamins in milk).

characteristic of another constituent deficiency of the B₂ complex. Rickets is quickly produced in young pigs; those born in winter require additional vitamin D. Daily doses of vitamins of the B complex are indispensable; deficiency symptoms disappear with a diet containing the vitamins in the natural form or by administration of synthetic vitamin B.—E. V. L.

HENDERSON, J. A. (1947.) **Ketosis in dairy cows with emphasis on treatment.**—*Cornell Vet.* 37. 292-304. [Author's summary copied verbatim.] 1323

The problem of ketosis in dairy cattle is reviewed briefly. Twelve cases, diagnosed clinically as ketosis of the "digestive" type, were treated with cobalt sulfate. They received no other treatment during the period of cobalt administration although several had been treated previously. Of these, nine showed marked clinical improvement, although one relapsed to her former condition within a few days. Three cows showed no distinct improvement which could be attributed to the treatment.

DISEASES, GENERAL

WINQVIST, G. (1945.) Topografisk och etiologisk sammanställning av de fibrinösa och ulcerösa endokarditerna hos en del av våra husdjur. [**Fibrinous and ulcerative endocarditis in domestic animals.**]—*Skand. VetTidskr.* 35. 575-585. [Abst. from English summary.] 1324

W. collected material from 222 cases of fibrinous and ulcerative endocarditis, of which 77 were from horses, 58 from cattle, 48 from pigs and 44 from dogs. About 75% of the cases were pure valvular endocarditis, while the remainder were parietal endocarditis, half of which were combined with a separate inflammatory process of the valves. More than half of the parietal endocarditis cases occurred in cattle.

It was found that a pure left-side affection dominated in horses, pigs and dogs, whereas 50% of the cases in cattle were pure right-sided and 25% pure left-sided affection; both halves of the heart were affected in the remainder. In horses, the aortic valves were most frequently affected, followed by the mitral, tricuspid and pulmonary valves. In cattle, the sequence was tricuspid, mitral, pulmonary and aortic valves, and in pigs and dogs, mitral, aortic, tricuspid and pulmonary valves.

Etiologically, a primary focus could often be seen in the form of diplococcal or suppurative infections in the sexual glands, sub-cutis and musculature. Bacteriological examination of 118 cases proved streptococci to be the dominant

cause, especially in horses and dogs. *Corynebacterium pyogenes* infection was a decisive factor in cattle and *Erysipelothrix rhusiopathiae* in pigs. —E. V. L.

LE SEAC'H, G. (1946.) La dermite estivale des équidés en Algérie. [**Summer dermatitis of horses in Algeria.**]—*Rec. Méd. vét.* 122. 442-448. 1325

The condition described attacks, in order of decreasing susceptibility, donkeys, mules and horses, affecting male horses, particularly entire, more than females. The native breeds of horse appear less susceptible than those of imported breeds. Animals are rarely affected under 2½-3 years of age. The disease is particularly related to the hot weather, but the mode of action of the heat is obscure; light or flies are apparently not essential aetiological factors. The disease occurs in the summer and tends to relapse. The lesions are eczematous, accompanied by pruritus, affecting particularly the sides of the neck, the shoulders, the fore-arms, and, especially, the anterior surface of the cannon bones (this latter feature helps in differentiating the disease from sarcoptic mange); it also occurs on the ventral surface of the abdomen. The condition is not contagious, and is not hereditary. Prognosis is rather unfavourable, as the pruritus leads to wasting, and the lesions may be disfiguring and favour habronemiasis. No effective local or general treatment has been found.

—E. COTCHIN.

BALLOT, A. (1947.) Deux entéro-toxémies de cheval: la typho-anémie et la méningo-encéphalite infectieuse. [**Infectious anaemia and infectious meningo-encephalitis of horses regarded as entero-toxaemias.**]—*Rec. Med. vét.* 123. 153-165. 1326

B. describes two serious diseases of horses in Seine et Marne. Equine infectious anaemia is characterized by intermittent fever with weakness, the animal dying from the effects of the second to seventh attack. "Infectious encephalomyelitis" appears in the stable to be mild colic, but can be diagnosed at a fairly early stage, by observing that the led horse fails to stop at word of command or when reined in. As the disease develops there occur attacks of progressively increasing unrest, with head butting a prominent feature, later frenzied movements resulting in self-injury and finally death. This disease is usually acute. Cases have been observed in horses having no direct or indirect contact with other horses.

At P.M. examination lesions are similar in both diseases; there is haemorrhagic peritoneal exudate, and the intestines are almost empty and the contents putrefy rapidly. The liver is congested and friable, and the kidneys soft and marbled. The spleen is voluminous. A degenerative myocarditis is present. There are no macroscopic lesions of the nervous system. On this basis B. postulates that both diseases are entero-toxaemias, and that both diseases are engendered by intestinal bacteria. [The reasoning is very unorthodox.]—J. EDWARDS.

KÖCHLI, O. (1947.) Pathologisch-anatomische und bakteriologische Untersuchungen über das Wesen der Strahlfäule des Pferdes. [**Pathological and bacteriological examination of thrush of the foot in the horse.**]—*Schweiz. Arch. Tierheilk.* 89. 338-350 & 384-397. 1327

K. discusses possible causes of thrush. Pathological studies were made of the microscopic structure of the normal and the diseased frog. Extensive necrosis and disintegration to detritus were found in the stratum corneum, granular hydropic degeneration in the stratum spinosum and increased mitotic cell division in the stratum germinatum.

Bacteria were isolated from the lesions which were capable of causing putrefaction *in vitro* and *in vivo*; *Bacterium coli-commune*, Gram-positive diplococci and *Clostridium sporogenes*. *Bact. coli* produces keratolytic ferments and also enables the anaerobes to grow. When alone, the diplococci have little fermenting power, but they seem to have an intensifying action on the other two species.

The predisposition of the condition to occur in the central sulcus of the frog might be explained

by the high water content of the surrounding tissues, or by the frequent occurrence of fissures in which the bacteria can colonise.

The severity and the kind of the putrefaction produced vary greatly with the composition of the bacterial flora, and the interaction of many other factors as temperature, pH, humidity, amount of work done, stable hygiene, hoof cleaning and the composition of horn; it might be influenced also by the reabsorption of poisonous breakdown products.—C. AHARONI.

SCHOFIELD, F. W. (1947.) Sudden death in calves associated with myocardial degeneration. —*Canad. J. comp. Med.* 11. 324-329. [French summary.] 1328

The disease occurs in calves usually at 6-12 weeks of age, and is characterized by sudden death without observable symptoms. In most cases myocardial degeneration of a hyaline nature is found, accompanied by gastro-enteritis. The cause was not determined but toxæmia from enteric infection is suspected. The gross and microscopic pathology are described in detail.

—P. J. G. PLUMMER.

LENTZ, R. W. (1944.) Der plötzliche Herztod der Schweine. [**Sudden fatal syncope of pigs.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 345-349. 1329

A résumé of the literature relating to the disease. The aetiology is obscure. L. discusses the epidemiology and pathology and discards suggestions that it may be due to excess protein feeding, solanin, zinc or copper poisoning or vitamin A deficiency. He is non-committal regarding the statements of KÖBE, MAAS, ASZMANN & KARSTEN [see *V. B.* 17. 482] who suggested that an infective agent was the cause. He examines Dobberstein's thyrotoxicosis theory [see *V. B.* 17. 482] in detail and states that the changes D. found in the thyroids of affected pigs were observed by KRAGE in the thyroids of pigs that had died from other diseases. Furthermore, MAAS found changes, similar to those described by D., in the thyroids of pigs that had died from swine erysipelas, pneumonia and nephritis while the thyroids from cases of syncope were normal.

It is suggested that, on affected farms, a "more natural breeding policy" should be followed and that blood lines that may spread the disease should be eliminated, and that at the same time feeding three times daily should replace twice daily feeding, diet being greatly reduced and mineral salts to be added to the diet.—A. L. W.

GUSTAFSON, W. E. (1947.) Preliminary studies on the agent of canine pharyngo-laryngo-tracheitis.—*Yale J. Biol. Med.* 20. 185-196. 1330

Experiments involving passage of nasopharyngeal washings from infected dogs [see *V. B.* 14. 163] through experimental dogs, and the inoculation of mice, g. pigs, rabbits and embryonated fowl eggs, are described. Although the production of the disease in dogs in one instance by bacteria-free allantoic fluid from inoculated eggs suggested a possible virus origin, transmission experiments with filtrates from washings were unsuccessful, and other results indicated that bacteria probably played an important part in the disease. However, no organism in throat cultures could be definitely incriminated. The significance of a *Shigella* species recovered from the faeces of some animals remained undetermined.

—E. COTCHIN.

DAVIS, J. E., & FLETCHER, D. E. (1946.) **Nervous system changes produced in dogs by choline and carbamyl choline.**—*J. Pharmacol.* 88. 246–253. 1331

Choline chloride and/or carbamyl choline was administered to dogs daily for several weeks and the animals killed either at the end of the period of treatment or some time later. Lesions were found in the central nervous system. In the acute stage they were characterized by multiple haemorrhages in the grey substance of the brain and spinal cord and by a diffuse gliosis and acute neurone changes. Later on lesions consisted of perivascular gliosis, glial nodules, diffuse glial scar formation and neurone depletion. Hyperchromic anaemia was also produced in these animals. The relation between the C.N.S. changes and those observed in pernicious anaemia are discussed.

—J. M. ROBSON.

MATHIEU, F. (1941.) **Excrétion urinaire du calcium et du phosphore chez le chien en insuffisance parathyroïdienne chronique. [Urinary excretion of calcium and of phosphorus in dogs with chronic parathyroid insufficiency.]**—*Arch. internat. Physiol.* 51. 278–289. 1332

The question whether the lowering of the blood calcium affected the renal threshold for calcium was studied in seven thyroparathyroidectomized dogs in a state of latent tetany. Within the range of blood calcium values studied (4.7–10.5 mg. per 100 ml.), calcium was still excreted in the urine. There does not therefore appear to be an excretion threshold for calcium in the dog. The urinary phosphorus was markedly reduced

See also abst. 1394 (infectious diseases, a textbook).

immediately after parathyroidectomy although there was a marked rise in blood phosphorus. In due course, however, the kidney recommenced to excrete phosphorus and the urinary value almost regained its normal level.—ALFRED T. COWIE.

WILSON, J. E. (1947.) **Some diseases of poultry.**—*Vet. Rec.* 59. 495–496. 1333

This note is a brief description of the poultry diseases exhibit designed for the 1947 Conference of the National Veterinary Medical Association. Photographs and specimens of the avian leucosis complex were included and also certain abnormal heart conditions. Particular attention was given to a relatively uncommon disease referred to as Round Heart disease.—J. D. BLAXLAND.

SHERLOCK, S. P. V. (1946.) **Biochemical investigations in liver disease; some correlations with hepatic histology.**—*J. Path. Bact.* 58. 523–544. 1334

Liver tissue for histological study was obtained by aspiration biopsy from a number of human patients with hepatic disease—acute hepatitis, cirrhosis, obstructive jaundice, and other miscellaneous conditions. The histological findings* were correlated with the results of tests on the patient's serum for bilirubin, alkaline phosphatase, total cholesterol, and total and differential proteins, and with the results of the intravenous hippuric acid and intravenous galactose tests. It is suggested that in the routine examination of jaundiced patients, the practical estimations of most value are for serum bilirubin and alkaline phosphatase, supplemented if facilities allow by estimation of differential serum proteins, the tests being repeated if possible at weekly intervals.

For example, in the cases of acute hepatitis, the amount of hepatic degeneration as shown histologically was reflected in the increased serum bilirubin, rapid recovery being accompanied by a rapid fall in the bilirubin level. In cases of cirrhosis that appeared histologically to be inactive, there were no constant biochemical abnormalities, but in histologically active cases the degree of depression of serum albumin reflected the severity of the process.

Serum phosphatase estimations were of assistance in the differential diagnosis of jaundice due to obstruction of the extrahepatic biliary system, most cases having a higher level than cases of jaundice due to liver disease.—E. COTCHIN.

POISONS AND POISONING

BODDIE, G. F. (1947.) **Toxicological problems in veterinary practice.**—*Vet. Rec.* 59. 471–478. Discussion pp. 479–486. 1335

B. dealt with the following:—poisoning of

cattle and sheep in central Scotland by fumes liberated during the destruction of war-stores of smoke-bombs; fluorosis; plant poisoning; diarrhoea, sometimes with dysentery, affecting

cattle in West Highlands, due to ingestion of yellow iris, *Iris pseudacorus*, roots thrown out in opening a drain, iris being a possible cause of other cases of diarrhoea of obscure origin in cattle; bracken poisoning; yew poisoning; poisoning by lead, arsenic, zinc phosphide, red squill; toxicity of some drugs—sulphanilamide, carbon tetrachloride, nicotine sulphate, D.D.T., phenothiazine and stilboestrol.

In the discussion, H. H. GREEN dealt with poisoning by lead, arsenic, copper, rat poisons, drugs (D.D.T., gammexane), industrial fluorosis and plant poisoning. T. M. MITCHELL discussed poisoning by ragwort, lead, sulphanilamide, phenothiazine, stilboestrol, and strychnine; K. D. DOWNHAM referred to phenothiazine poisoning in young pigs and HCN poisoning in cattle; H. G. LAMONT spoke of bean poisoning.—E. COTCHIN.

CAMERON, G. R., GADDUM, J. H., & SHORT, R. H. D. (1946.) **The absorption of war gases by the nose.**—*J. Path. Bact.* 58. 449–455. 1336

When rabbits inhale lethal concentrations of mustard gas or of nitrogen-mustard gas, death is frequently observed to occur in the absence of any lung damage, but there is always a severe inflammation of the nasal cavities. In contrast, lethal concentrations of phosgene, which seldom if ever fail to produce pulmonary oedema, cause at most a slight congestion of the nasal mucosa. Experiments on rabbits showed that 80–90% of mustard or nitrogen-mustard gas was lost during passage through the nose, while with phosgene only about 25% was lost. A similar contrast was seen in monkeys (*Macacus rhesus*), but was less marked, owing possibly to their less complicated nasal structure as compared with the rabbit.

It is suggested that, while the nose may help to protect the lungs against direct damage by the mustard vapours, it may be an important route of absorption.—E. COTCHIN.

STEYN, D. G. (1946.) **Salt poisoning in stock.**—*Fmg S. Afr.* 21. 472–473. 1337

A short note on the dangers of salt poisoning for the general farmer.—J. D. BLAXLAND.

I. MCGOWAN, J. C., & BRIAN, P. W. (1947.) **Inhibition of catechol bacteriostasis by molybdates.**—*Nature, Lond.* 159. 373. 1338

II. BLASCHKO, H. (1947.) **Inhibition of catechol bacteriostasis by molybdates.** [Comments on.]—*Nature, Lond.* 159. 373. 1339

I. A possible explanation of the fact that excess molybdenum in the pasture causes the scouring disorder known as "teart" is put forward. Since it is known that catechol, like other phenols is bacteriostatic, it is suggested that the activity

of bacteria in the normal intestine of the ruminant is controlled by catechols and that molybdates reduce the effective concentration of catechols by forming complexes. The formation of the molybdenum-catechol complexes would inhibit the bacteriostatic control exerted by the catechols, bacterial activity would then become excessive and cause diarrhoea. This hypothesis is still to be confirmed.

II. B. reports that an extract of ingesta obtained from a rumen-fistula sheep after feeding on fresh grass cuttings for two days gave the reaction between molybdates and catechols suggested in I.—R. ALLCROFT.

HEINRICHS, D. H., & ANDERSON, L. J. (1947.) **Toxicity of sorghum in southwestern Saskatchewan.**—*Sci. Agric.* 27. 186–191. 1340

Climatic conditions such as severe drought and frost tend to increase the formation of potential HCN in the tissues of sorghum plants (*Sorghum vulgare*). Since these conditions occur frequently in the prairie provinces and sorghum generally yields less than other annual fodder crops, its value in this region is doubtful. If sorghum is grown it is preferable to use low acid varieties. Soil differences may also play a part in the production of potential HCN. Leaves contained much more HCN than stems and curing decreased the acid content. Toxic amounts of HCN were found in practically all samples of black amber sorghum collected at different locations and the concentration was greater in plants grown under drought conditions.

—R. GWATKIN.

WESWIG, P. H., FREED, A. M., & HAAG, J. R. (1946.) **Antithiamine activity of plant materials.** [Correspondence.]—*J. biol. Chem.* 165. 737–738. 1341

Bracken, *Pteris aquilina*, from an area in which a severe outbreak of bracken poisoning in cattle occurred, was fed at a level of 40% to rats. After ten days the animals lost weight, developed symptoms indicative of vitamin B₁ deficiency and died within three weeks. The symptoms and loss of weight could be prevented or cured by supplements of 0.5 mg. of vitamin B₁ daily *per os*. The antithiamine factor was stable when heated at 105°C. in air for 18 hours. It was insoluble in ethyl ether and acetone, but slightly soluble in 92% ethyl alcohol. The explanation of bracken poisoning still remains obscure, being complicated by synthetic activity of the ruminal microflora. The symptoms observed in the rat were similar to those reported in horses [see also Lander's Veterinary Toxicology 1945, p. 289] rather than those in ruminants.—E. KODICEK.

PHARMACOLOGY AND THERAPEUTICS

SCHOFIELD, F. W., & BARNUM, D. A. (1947.) **Limitations in the use of penicillin in the treatment and eradication of bovine mastitis.**—*J. Amer. vet. med. Ass.* **110.** 92–95. 1342

The intelligent use of penicillin necessitates a bacteriological diagnosis of the infection present in the udder. In mastitis due to *Corynebacterium pyogenes* and *Staphylococcus aureus* early use of the drug is important and delay may have serious and even fatal consequences. In acute outbreaks of mastitis with rapid spread, penicillin is of limited value in the eradication of the infection, but has marked clinical value and should be used for this purpose only in such outbreaks. To obtain the maximum benefit from penicillin the administration of the drug by the trained stockman under the supervision of the veterinary surgeon will sometimes be necessary.—J. M. R. FILION, R. (1947.) Nouvelle forme d'administration de la penicilline. [Bougies.] [Penicillin bougies.]—*Canad. J. comp. Med.* **11.** 114–116. [In French: English summary.] 1343

Absorbable bougies containing 25,000 units of penicillin and inserted in the teat of each quarter of the udder were effective in the treatment of mastitis.—THOMAS MOORE.

SCHNEIERSON, S. S. (1947.) **In vitro effect of penicillin upon toxins of *Clostridium welchii*, type A.**—*J. Immunol.* **56.** 307–310. 1344

Penicillin failed to inactivate or neutralize *in vitro* the haemotoxin, lecithinase, necrotoxin or lethal toxin of *Clostridium welchii*, type A filtrate. —J. M. ROBSON.

STRANDSKOV, F., & WYSS, O. (1946.) **The inhibition of bacteria by thiopyrimidines.**—*J. Bact.* **52.** 575–579. 1345

The quantitative aspects of thiouracil and thiothymine inhibition on *Bacterium coli* and *Lactobacillus casei* are reported. *B. coli* produced no growth in presence of 25 mg. % thiouracil, but the addition of one part of uracil to 100 of thiouracil resulted in normal growth. The thiouracil was not metabolized. Continued transfer on thiouracil medium produced resistant strains.

L. casei was more sensitive to thiouracil, but inhibition was suppressed at a ratio of 1:1. By determining the ratio of the metabolite to inhibitor, concentrations of uracil below 1 mg. per ml. could be estimated.

Thiothymine (5-methyl thiouracil) showed little activity against *B. coli* but was effective against *L. casei*. A metabolite (thymine) to inhibitor ratio of 1:100 resulted in complete reversal of inhibition. In presence of folic acid thiothymine produced no inhibition. 4-methyl thiouracil had no bacteriostatic activity.—N. SABA.

CHOUCROUN, N. (1947.) **Tubercle bacillus antigens. Biological properties of two substances isolated from paraffin oil extract of dead tubercle bacilli.**—*Amer. Rev. Tuberc.* **56.** 203–226. [Author's summary copied *verbatim*.] 1346

1. Two fractions of biological significance have been isolated from paraffin oil extract of dead tubercle bacilli.

1. A proteinic component which seems to be the "sensitizing" antigen of the tubercle bacillus. This component has the power of establishing hypersensitivity of the tuberculin type, when injected in paraffin oil, intraperitoneally, into normal animals.

2. A carbohydrate-lipid complex, chloroform soluble, which has the property of producing lesions in the lung of guinea pigs, when as small an amount as one gamma in paraffin oil is injected intraperitoneally. This carbohydrate-lipid complex has been found to have the capacity of inducing antibody-formation when injected into normal animals. The water soluble part of the hydrolysate of this antigenic component gives specific precipitin reactions with the sera of rabbits and guinea pigs which have been immunized with the whole oil extract, and with the sera of animals which have been immunized by the carbohydrate-lipid complex alone, and also with sera of animals which have been immunized with whole tubercle bacilli.

The preparation of the oil extract and the preparation from it of the antigenic components are described in detail.

Animal experiments on the relation of hypersensitivity to immunity established clearly that a high degree of hypersensitivity does not help the mechanism of acquired resistance, even when the state of hypersensitivity is induced in animals by the isolated "sensitizing" component of the tubercle bacillus.

Explorative experiments on the relation of carbohydrate-antibodies to immunity indicate that the carbohydrate-lipid complex might play a rôle in the mechanism of acquired resistance.

STEENKEN, W., & WOLINSKY, E. (1947.) **Streptomycin in experimental tuberculosis. I. Its effect upon a well-established progressive tuberculous infection in guinea pigs.**—*Ibid.* **56.** 227–240. [Authors' summary copied *verbatim*.] 1347

$H_{37}R_v$ microorganisms, 0.021 mg. dry weight, were injected subcutaneously into 34 guinea pigs; 8 previously vaccinated with $H_{37}R_a$ and 26 normal animals. Forty-nine days later, when the disease was well established, strepto-

mycin treatment was started on 14 nonvaccinated and 4 vaccinated animals. Each treated pig was given 24,000 units (micrograms) per day subcutaneously, in doses of 4,000 units every four hours, for twenty days. The dosage was then reduced to 16,000 units per day, given as 4,000 units every four hours from 9 a.m. to 9 p.m. After forty days of treatment, half of the nonvaccinated-treated animals and all 4 vaccinated animals were taken off treatment and allowed to live for another eighty-eight days. At the end of this period, 175 days after infection, and 125 days after treatment was started, the experiment was terminated by sacrificing all surviving animals.

All the nonvaccinated controls died of tuberculosis within sixty-nine to 140 days. None of the treated pigs, and none of the vaccinated controls, died during the 175 days of the experiment. The animals treated continuously for 125 days showed very little tuberculous disease at autopsy. Virulent tubercle bacilli were recovered from 5 of these 7 pigs by subinoculation. The animals treated for forty days only, demonstrated a slowly progressive, chronic type of tuberculosis at autopsy, similar to that of the vaccinated controls, and virulent tubercle bacilli were recovered from all 7 by subinoculation and subculture.

BENSON, D. V. (1947.) **Streptomycin in the treatment of pullorum in baby chicks.**—*Vet. Med.* 42. 72-73. 1348

The results of three experiments are described in which two-day-old chicks, artificially infected with *Salmonella pullorum*, were treated with subcutaneous inoculations of streptomycin, dissolved in sterile saline solution at the rate of 10,000 and 5,000 units per 0.1 ml., treatment being commenced 24 hours after inoculation in one experiment and 16 hours after in the others. The best results were obtained with an initial dose of 5,000 units followed by 2,500 units for eight days; at a fortnight old three out of 26 treated chicks had died compared with 23 of the untreated chicks. [The possibility of "carriers" persisting among the treated survivors of these experiments is not discussed.]—J. D. BLAXLAND.

BROWNLEE, G., GOODWIN, L. G., & WALLS, L. P. (1947.) **Phenanthridinium compounds and bovine trypanosomiasis.** [Correspondence.]—*Vet. Rec.* 59. 518. 1349

The suggestion that samples of dimidium bromide (1553) may vary in toxicity is deprecated, and it is pointed out that a re-examination of 12 samples failed to reveal any variation in the toxicity to mice, and when assayed for activity against *T. congolense* no significant differences could be detected between samples. In the course of extensive pharmacological investigations on labora-

tory animals and cattle no delayed toxic effects, such as photosensitization, have been encountered.

Both 1553 and 897 persist in the blood for some 24 hours after subcutaneous injection, but the concentration of 1553 is twice as great as for 897. There is laboratory evidence that 1553 is about three times as active as 897 against mouse infection with *T. congolense*, and a valid comparison of the toxic effects of the two drugs would require the administration of doses of equivalent therapeutic value.

A plea is entered that any parallel investigation of toxicity made in Africa should include a comparison at therapeutically equivalent doses, tested at the same time and place, in the same herd of cattle.—U. F. RICHARDSON.

SCHUELER, F. W., CHEN, G., & GEILING, E. M. K. (1947.) **The mechanism of drug resistance in trypanosomes. I. A method for differentiating strains of resistant trypanosomes.**—*J. infect. Dis.* 81. 14-18. 1350

By a statistical technique the resistances of low and highly resistant strains of *Trypanosoma equiperdum* were compared with respect to the arsenoxide drug mapharsen. The criterion used was the suppressive effect of the drug on glucose utilization by the parasites *in vitro*.

A known strain of normal *T. equiperdum* and a highly resistant "permanent" strain were compared with low resistant strains developed for the purpose of the experiment by treating a normal strain both *in vitro* and *in vivo* with mapharsen.

It was concluded that there was a significant difference in the inhibiting power of the drug on glucose utilization by the different strains.

—S. BRIAN KENDALL.

STEFÁNSKI, W. (1945.) **Kilka słów o pozornym wyleczeniu świerzbu u jednokopytnych. [The so-called cure of sarcoptic mange.]**—*Med. Wet.* 1. 223-225. [Abst. from French summary.] 1351

S. speaks of relapses in horses given routine treatment for sarcoptic mange. He also speaks of immunity following cure after an attack of the disease. [There is insufficient evidence that the treatment was really sufficient to effect cure.]

—J. H.

RAY, H. N. (1946.) **Control of surra in animals in India.**—*Indian Fmg.* 7. 395-396. 1352

Among other methods of diagnosis, an intradermal test (suspension of *Trypanosoma evansi* in glycerol and saline) has some reliability. The three important points in control are:—detection of latent carriers (in India, mainly cattle), adequate treatment of latent and clinical cases and control of fly.—F. C. MINETT.

ORLOV, I. V. (1944.) Mocha zhivotnykh kak dezinvasionnoe i dezinfektsionnoe sredstvo. [Animal urine as a larvicide and insecticide.]—*Veterinariya, Moscow*. No. 4. pp. 21–22. 1353

After a brief summary of the factors governing helminth infection, and its control by the breaking of contact between the host animal and its excreta, attention is drawn to the relative freedom from helminths of the peasant-owned sheep of some areas of Russia, where the animals are kept in sheepcotes which are only cleaned out once or twice a year. On examining the faeces, eggs and larvae of parasites were only found in fresh faeces; the compressing of the faeces appeared to destroy them, as did also the scattering and drying of faeces.

Experimenting on the value of urine as a larvicide 100 g. of fresh sheep faeces highly infested with larvae and eggs of strongyles was placed in jars and fresh, or stored, sheep's urine added in amounts varying from 5–25%, the worm development in these being checked against untreated control material. It was found that urine was lethal to larvae in the first and second stages, but did not affect eggs or larvae in the infective stage. The inimical action began to appear with a urine concentration of 20%, stale urine being more active than fresh urine. It is suggested that the ammonia liberated as the urine decomposes acts as the larvicidal agent.—U. F. R.

DU TOIT, R. (1946.) D.D.T. for the protection of sheep against blowfly.—*Fmg S. Afr.* 21. 542–544. 1354

D.D.T. is extremely lethal to first-stage blowfly larvae although ineffective against mature larvae. A water or oil emulsion of D.D.T. can be applied by means of a spray pump. First the wool around the tail and inner aspect of the hind legs should be sheared and all soiled locks removed. The spraying must include the wool around the base of the tail, the hind aspect of each leg down to the hocks together with the wool present in the crutch. Rams may also be sprayed over the top of the head and between the horns. DU T. states that a very high degree of protection against blowfly strike is afforded for a period of approximately three months. A gallon of 5% emulsion spray produced by the Government C.D. factory under the name of grenade V brand emulsifying liquid is sufficient for 100 sheep. Sheep should be treated just prior to the onset of blowfly activity. The spray should not be used for the treatment of sheep already struck.

—BERYL A. THURSTON.

RUBTZOV, I. A. (1937.) Oput primeneniya neftyanuiikh i karbolovuiikh emulsiif dlya borbui s moshkami. [Investigations on the use of

mineral oil emulsions for the control of *Simulium*.]—*Trav. Acad. milit. Méd. Kiroff Armée Rouge*. 8. 171–220. [In Russian, English summary. Abst. in *Rev. appl. Ent.* Ser. B. 33. 186. (1945), copied *verbatim*.] 1355

In addition to a detailed account of experiments in eastern Siberia in 1932 and 1933 on the control of the larvae of *Simulium* spp. by means of oil emulsions, descriptions are given of others in which an emulsion of carbon bisulphide was tested by the same technique. It contained 68 per cent. by weight of carbon bisulphide, 8 per cent. soap paste and 24 per cent. water. When diluted to a concentration of 0.2 per cent. carbon bisulphide in water at a temperature of 12.8°C. [about 54°F.], it killed 95, 98 and 100 per cent. of larvae in the third and fourth instars after exposures of 4, 8 and 10–15 minutes, respectively. It was observed that the older larvae were more resistant than the younger ones. A solution of carbon bisulphide in water at concentrations of 1:700 and 1:1,000 which are the highest possible in practice, gave poor results.

Since emulsions of carbon bisulphide are heavier than water they spread well over the bottom of a stream and penetrate under or between stones. They are thus very suitable for use in streams with a pebbly bottom, where Simuliid larvae concentrate. It was considered that to obtain the best results, streams should first be treated with an oil emulsion to kill or dislodge the larvae attached to plants, and then with carbon-bisulphide emulsion, to destroy those that drop to the bottom or occur under stones, and this was confirmed in a field experiment in which the combined treatment was applied to a stream flowing at a rate of a little over a mile an hour in which the water passed at the rate of about 66 gals. per second and had a temperature of 18°C. [64.4°F.]. The amounts used were about 110 gals. oil emulsion, applied from two containers over a period of 10 minutes, and about 33 lb. carbon bisulphide emulsion diluted with an equal quantity of water. A day later, no living larvae were found in a stretch of the stream some 1,100 yds. long.

HIBBS, J. W., & KRAUSS, W. E. (1947.) The effect of supplementary vitamins on blood composition, liver storage, and incidence of scours in calves.—*J. Dairy Sci.* 30. 115–120. 1356

Groups of calves given moderate daily doses of vitamin A (10,000 U.S.P. units) for 20 days, and massive doses (250,000 U.S.P. units) on the third and tenth days of life maintained a higher plasma vitamin A level after the third day than did undosed control groups. The storage in the liver rose with increased intake of the vitamin but

plasma vitamin A levels and liver storage were not closely correlated except at low levels of vitamin storage.

Daily addition of nicotinic acid when massive doses of vitamin A were given had no effect on the level of plasma or liver storage values of vitamin A. Beyond a slight initial increase between the third and seventh days there was little effect on plasma ascorbic acid levels when daily doses of 250 mg. vitamin C were fed for 20 days. The addition of supplementary vitamins to the normal ration had no significant effect on lowering the incidence or severity of calf scours and it is concluded that the practice of routine supplementary feeding of these vitamins to calves during the first few weeks of life is of doubtful value in preventing scours.

The feeding of supplementary vitamin A either in regular moderate doses daily or in massive doses on the third and tenth days helps to overcome any deficiencies of vitamin A intake resulting from inadequate feeding of colostrum or whole milk, from impaired absorption, and from subsequent feeding of hay low in carotene.—A. E.

ISAKSSON, A. (1945.) Om pälsfel hos den farmade räven i Sverige. En översikt jämte redogörelse för ett fall. [**Fur defects in captive foxes in Sweden. Review and report of one case.**—*Skand. VetTidskr.* 35. 281-292. [Abst. from English summary.] 1357

I. describes a case of double moult in a blue fox, one of 230 cases among fox-cubs on a Swedish farm.

After experimental treatment, as a polyvalent vitamin B deficiency, with large doses of dried brewers' yeast (10 g. cervical B per day), which checked the moult in a few days, new guard hairs of good quality quickly appeared on the upper coat.

Plentiful and continuous dosing of blue fox cubs with yeast during fur development is therefore advised.—F. E. W.

SILBERBERG, M., & SILBERBERG, R. (1945.) **Combined effects of an estrogen and an anterior hypophysial extract on the skeleton of the growing mouse.**—*Arch. Path.* 39. 381-387. 1358

The continued, simultaneous injection, over periods of one week to 16 months, of oestrogen and anterior hypophysial extract into mice caused independent effects both of which resulted in accelerating the age changes in cartilage and in overproduction of bone. The anterior hypophysial extract was active by stimulating osteoblastic bone formation and the oestrogen by promoting hyalinization of the marrow and by inhibiting the resorption of bone.—R. MARSHALL.

KNOWLTON, A. I., LOEB, E. N., STOERK, H. C., & SEEGAL, B. C. (1947.) **Desoxycorticosterone acetate. The potentiation of its activity by sodium chloride.**—*J. exp. Med.* 85. 187-198. [Authors' summary copied verbatim.] 1359

Desoxycorticosterone acetate (DCA) and NaCl, in the dosage employed in normal rats, caused renal and cardiac hypertrophy, characteristic changes in the renal tubular epithelium, atrophic changes in the subcapsular zone of the adrenal cortex, and serum electrolyte changes characterized by a rise in sodium and fall in potassium. In rats rendered nephritic with a rabbit anti-rat-kidney serum, the same regimen caused similar changes. In addition, DCA given concurrently with NaCl greatly intensified the nephritic process and gave rise to striking arterial hypertension. A diet, virtually sodium-free, administered to normal and nephritic rats receiving daily injections of DCA abolished or reduced to a minimum the effects of this steroid; i.e., a liberal ingestion of NaCl was essential for the potentiation of the action of DCA. The addition of KCl to the drinking water of rats receiving DCA and NaCl tended to correct the depression of the level of potassium in the serum, but had no effect on the hypertension in nephritic animals nor upon the anatomical lesions. The mechanism by which the sodium ion potentiates the activity of DCA has not been established.

I. RIKER, W. F., & ROSENFELD, G. (1946.) **The effect of 2,3-dimercaptopropanol (BAL) on the whole blood and plasma concentration of arsenic after mapharsen in cats.**—*J. Pharmacol.* 87. No. 4. Suppl. pp. 72-75. 1360

III BRAUN, H. A., LUSKY, L. M., & CALVERY, H. O. (1946.) **The efficacy of 2,3-dimercaptopropanol (BAL) in the therapy of poisoning by compounds of antimony, bismuth, chromium, mercury and nickel.**—*Ibid.* 87. No. 4. Suppl. pp. 119-125. 1361

I. The elimination of As in the blood stream was followed in five cats after a single intravenous injection of 3 mg. per kg. of mapharsen at one minute and then at hourly intervals for 6 hrs. There was a rapid fall in the As concentration of both whole blood and plasma from between 400-500 μ g. to about 100 μ g. in the first hour, after which the plasma As fell to about zero in 5-6 hrs. while the whole blood As level was maintained at a relatively high value for at least 6 hrs. and possibly longer thus indicating the fixation of As by the red cells.

Six cats which received a similar injection of mapharsen were given a single intramuscular dose of 0.02 mM per kg. BAL in oil either 4 or 18 hrs. after the mapharsen and subsequent As blood

values were observed. There was a sharp rise in the As concentration of the whole blood and plasma during the first hour followed by a more gradual rise to a maximum concentration at the second hour, after which the level fell rapidly reaching approximately control levels in 4 hrs. Subsequent injections of BAL did not cause any increase in blood As values indicating that the first dose of BAL was sufficient to mobilize all the available As.

It was further shown that the increase in whole blood As concentration following BAL is essentially in the plasma fraction which agrees with the concept that BAL effects a withdrawal of As from the tissues.

II. Investigations were made using 1226 rabbits on the effectiveness of BAL in acute intoxication caused by compounds of antimony, bismuth, nickel, chromium, mercury, lead, thallium and selenium. The control animals had a single toxic dose of the metallic compound injected intramuscularly in the gluteal muscles of the right leg and the treated animals received a similar injection plus an injection of a 3% aqueous solution of BAL into the gluteal muscles of the left leg. In most cases a dose of 90 mg. per kg. of BAL was given one hour after injection of the

toxic substance followed by doses of 15 mg. per kg. 6, 24 and 48 hrs. afterwards.

Results showed that BAL was an effective antidote in poisoning by salts of Sb, Bi, Cr, Ni and Hg, the tolerance to lethal doses of these substances being increased by at least 50%.

It was ineffective in the treatment of acute and chronic poisoning by Pb and Se and in acute poisoning by Tl. In the case of Pb and Se the effect of BAL appeared to increase the toxicity of compounds of these two metals.—R. ALLCROFT.

SADIKOVIĆ, A. (1942.) Der Einfluss von Causyth, Yatren, Chinosol und Milchinjektionen auf den Blutzuckergehalt und die Körpertemperatur. [Effect of causyth, yatren, chinosol and milk injections on blood sugar level and body temperature.]—*Vet. Arhiv.* 12. 212–221. [In German.] 1362

Causyth when given by the mouth to rabbits, caused a rise in blood sugar and a fall in temperature; yatren gave indefinite results; chinosol caused a fall in blood sugar and rise in temperature; while milk (protein) injections caused a rise in blood sugar and also in temperature. [Chinosol is a quinoline derivative. Causyth and yatren are substances chemically related to chinosol].

—R. MARSHALL.

See also absts. 1261 (TB.); 1262 (erysipelothe infection); 1339 (penicillin and toxins); 1318 (colchicine therapy of tumours).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

HANSON, J. (1947.) The histogenesis of the epidermis in the rat and mouse.—*J. Anat.* 81. 174–197. [Author's summary copied verbatim.] 1363

A comparative account has been given of the histogenesis of the epidermis on the trunk and foot of albino mice and Norway rats aged 10 days post-coitum to 100 days post-partum. Observations on cell division have led to the conclusion that in the epidermis of the mouse and rat differentiating cells do not normally divide. Differences in epidermal development have been found between the rat and mouse and between the trunk and the lower surface of the foot. These differences can be correlated with the density of the hair coat or with its absence. The type of epidermis which is relatively resistant to chemical carcinogenic agents (the epidermis of the rat and that of the mouse's foot) has been shown to differ from the type which is relatively sensitive (the epidermis of the trunk of the mouse).

MACLEOD, J., PONDER, E., AITKEN, G. J., Jr., & BROWN, R. B., Jr. (1947.) The blood picture of the thoroughbred horse.—*Cornell Vet.* 37. 305–313. 1364

The authors examined the blood of about 100 thoroughbred horses of various ages and com-

pared the values thus obtained with those obtained by themselves and other workers on horses of other breeds. They report that the erythrocyte counts and haemoglobin levels were significantly higher than in those of all other breeds examined except the Arab. The finding of acidophilic rod-shaped inclusion bodies in the cytoplasm of neutrophils is reported. These bodies were found in about one-third of all animals studied, being most frequent in the blood of weanlings.

In addition to the above-mentioned values urea nitrogen, serum calcium, serum phosphorus, serum chloride and serum protein, were estimated, the only difference in these values was that the thoroughbred in training had a higher serum chloride level than other breeds.—J. A. J. VENN.

SJÖBERG, K., & ÅKERBLÖM, E. (1942.) Über eine Depressorsubstanz, die sich im Serum in vitro bildet. [A blood pressure reducing substance, which is produced by serum in vitro.]—*Acta Physiol. Scand.* 4. 317–322. [In German.] Reprinted in *Medd. Veterinärhögsk. Stockh.* 16. (1942.) 1365

Incubation of horse, human or bovine serum at 38°C. for several days produced a substance which, on injection of 0.1–0.2 ml. into cats, produced a marked lowering of blood pressure. The

action was similar to that of histamine, but the substance was not identical with any of the known depressor substances. It was not precipitated by protein precipitants, was soluble in water and in alcohol and ether, was stable for 30 minutes at 60–65°C. in serum, but when purified was sensitive to temperature. A purified preparation contained about 50% of phosphatide, calculated as lecithin, which suggested that the active material might be a phosphatide.—R. MARSHALL.

MALAHOVSKIĀ, A. JA. (1946.) Ob individualnom podbore v konevodstve v svyazi s immuno-biologičeskimi osobennostjami krovi. [Individual matching in horse breeding in connection with immuno-biological blood properties.]—*Dokl. Akad. sel'khoz. Nauk.* No. 1/2. 36–41. [Abst. from abst. in *Anim. Breed. Abstr.* 15. 10. (1947.)] 1366

The authors are of the opinion that a red cell agglutination test to classify horses according to their blood groups can be used as an additional guide for the selection of horses for breeding, using also performance tests and pedigree. It is stated that the erythrocyte agglutinogens influence the cells of different tissues, including sexual cells, and therefore reproduction.

BRAUN, W. (1946.) Average levels of various constituents, physical properties, and formed elements of the blood of cows on pasture.—*Amer. J. vet. Res.* 7. 450–454. 1367

Forty-nine normal cattle, mainly Holstein-Friesian, of various ages were kept on a permanent pasture in California during the period March–September, and eight of them were continued until the following February on the same pasture. A description of the pasture on which the animals grazed and its seasonal variations are included, together with a reference to the methods used for the various estimations.

The following average values of the blood of the cows with standard deviations are recorded:—erythrocyte, leucocyte and differential counts, haemoglobin, packed volume, glucose, total N, non-protein N, albumin, globulin, inorganic phosphate and sulphate, serum phosphatase and chloride, specific gravity, viscosity, vitamins A and C and carotenoids. The results are classified under the following headings:—all ages, young animals, old animals. A further table records the significance of differences in data, the whole of the data from which this table is constructed is not quoted in the article.—J. A. J. VENN.

HANSEN, E. (1944.) Studies on changes in the mesenteric lymph node in the albino rat produced by the chyle passage with advancing age.—*Acta path. microbiol. scand.* Suppl. No. 54. pp. 102–116. [In English, author's summary slightly amended.] 1368

Owing to the continual fat movement with senility the mesenteric lymph node ("the pancreas of Aselli") of the rat is the site of a pronounced proliferation of the cells taking part in the fat metabolism, namely: the reticulum cells in the central sinus and lymphoid tissue. The reticulum cells become free and aggregate in close-packed clusters; at some point of time, depending on the fat supply—in the present material, during the 4th month—these clusters of reticulum cells undergo fusion and form giant-cells which continually increase in size and occupy a considerable part of the lymph node at the age of two years. These giant-cells absorb and utilize it. Presumably their capacity for fat absorption is specific.

STEINBERG, B., & HUFFORD, V. (1947.) Development of bone marrow in adult animals.—*Arch. Path.* 43. 117–126. [Authors' summary copied *verbatim.*] 1369

The complete marrow of one or both tibias was extirpated in 44 living rabbits. The marrow was allowed to regenerate. Animals were killed at intervals for a period of two months, and regeneration was studied. The probable development of marrow is indicated within the limits of a morphologic experiment.

The reformation of marrow began from the tibial endosteum with offshoots of primitive reticular cells and formation of bone spicules. Approximation of two or more of the primitive reticular cells gave rise to fat spaces.

Presence of fat spaces was prerequisite to formation of myeloid elements in the marrow. Regeneration was not uniform. In various parts of marrow there was considerable variation in formation of fat spaces, reestablishment of normal proportions and numerical contents of cell types, and refilling of the tubular shaft of the bone.

Regeneration of marrow in adult rabbits apparently followed closely the pattern of fetal development.

Granulocytic leukocytes, erythrocytes and megakaryocytes were derived apparently from a single primitive reticular cell.

FAWCETT, D. W., WISLOCKI, G. B., & WALDO, C. M. (1947.) The development of mouse ova in the anterior chamber of the eye and in the abdominal cavity.—*Amer. J. Anat.* 81. 413–443. [Authors' summary copied *verbatim.*] 1370

Segmenting mouse eggs were transplanted to the anterior chamber of mouse eyes or to the peritoneal cavity where they produced blastocysts. In the eyes they survived as autotransplants or as homotransplants in immature females and normal and castrate males. All showed considerable growth of trophoblast and in less than half there was a slight degree of differentiation of an inner cell mass. The growth of the eggs was slowed

in the eye and body cavity and they had a limited life span of about 15 days, attributable partly to the fact that the proliferating trophoblast never became vascularized by actual circulating blood.

The eyes and peritoneum responded by new growth of blood vessels and connective tissue occurred at the site of attachment of the blastocysts. The trophoblast produced edema of the adjacent maternal stroma and hemorrhages from neighboring blood vessels, effects attributed to a chemical substance secreted by the trophoblastic cells.

In the transplants, giant cells derived from the wall of the blastocyst and hence of fetal origin appeared to be identical with the giant cells characteristic of the central zone of the normal mouse's placenta. These cells frequently phagocytized extravasated erythrocytes.

The zone pellucida was removed from the eggs in extra-uterine sites independently of any direct agency of the uterus.

Mouse ova placed in the eye were capable of developing in close proximity only until the most precocious one among them began to implant. Thereafter the others quickly degenerated. Blastocysts implant in the uterus only at prescribed times in certain predetermined and especially prepared sites. In the eye they implanted regardless of the age or sex of the host, attaching themselves as a rule to the iris, cornea or sclera in the corneoscleral angle. The respective roles of endometrium and blastocyst in normal implantation are discussed in the light of the present findings.

SALOMON, K., GABRIO, B. W., REINHARD, E., & SILBERBERG, R. (1947.) **Effects of estradiol benzoate and their modification by bleeding.**—*Arch. Path.* 43. 76–85. [Authors' summary copied *verbatim*.] 1371

Injectations of 0.84, 2.28 and 3.36 mg. of estradiol benzoate failed to raise the plasma calcium level of sexually immature cockerels above the normal upper limits of variation. The estrogen caused inhibition of growth and of breakdown of the epiphyseal cartilage and produced myelofibrosis and hyperossification of the metaphyses and the areas close to the endosteal surfaces of the shaft. Cockerels that had been bled prior to and during the administration of the estrogen showed a tendency toward increased myelofibrosis and bone formation.

GAEDE. (1941.) **Die Weltraumstrahlung und ihre biologische Wirkung.** [**Cosmic rays and their biological activity.**]—*Dtsch. med. Wschr.* 67. 1044–1045. 1372

The exact sciences are penetrating further and further into the realms of medicine and the basic

ideas on radiation must be mastered in diagnosis and therapy. In recent times the existence of some kind of ultraterrestrial radiation has been repeatedly under discussion and it has been assumed that this must exert a considerable influence on the course of biological processes. The combined work of physicists and biologists has yielded a vast store of knowledge about cosmic radiation and this together with much original work has been compiled by EUGSTER & HESS (1940). At the beginning of the century it was observed that there were more charged particles in the air than could be accounted for by known causes such as radio-active disintegration. A characteristic of this radiation was its power of penetrating artificial or natural barriers such as lead plates or the depths of a lake. These barriers reduce the ionization but do not stop it. High altitude flights have shown that radiation increases with height which discountenances the theory of its terrestrial origin. NERNST suggested that the radiations originated in the fixed stars on the Milky Way. [Some investigators believe that the rays arise as a result of the actual building up of matter from its component ultimate positive and negative particles thus converting mass into energy; others that the rays may be derived from the destruction of matter.] In cosmic rays we are dealing with a corpuscular radiation which is not uniform in regard to mass and velocity. The amounts of energy of individual particles are enormous as compared with any other radiation. Electrons in *gamma* and Röntgen radiations cannot penetrate a lead plate of 1 cm. thickness because they lose energy by radiation but the particles of cosmic radiation have, owing to their greater mass, a far higher power of penetration than electrons of the same charge. There is much evidence that primary radiations of cosmic origin have no real influence on the course of biological processes. New investigations of HESS & EUGSTER show that secondary radiations, such as are present in showers which are produced when particles encounter solid materials, have quite considerable effects. Experiments made on the Hafelkar mountain (2,340 m.), *i.e.*, with a high degree of radiation and frequent formation of showers, and also in the depths of a mine, *i.e.*, with the almost complete elimination of radiation occurring at high levels, biological materials for test were exposed with and without protection, *i.e.*, with and without the maximum formation of shower. The materials exposed included spores of *Bacterium violaceum* and *Bact. fluorescens*, seeds of *Avena sativa*, *Phleum pratense*, *Linum usitatissimum* and *Antirrhinum majus*, *Drosophila melanogaster* and rabbits and mice with tumours. The most conclusive results were obtained from the

experiment with bacterial cultures. The cultures were placed in petri plates between a lead plate and a photographic plate. If the photographic plates revealed a shower after several months' exposure the cultures showed a considerably less growth at the time of the shower. The germination of plant seeds was also affected. Rabbits showed lasting effects after long exposure to the action of shower and become almost sterile and the changes in the reproductive organs were reminiscent of avitaminosis. Mice affected with tumours and subjected to lead, *i.e.*, to intensified shower treatment, regularly developed carcinomas while in those of a tumour bearing strain there was a marked decrease in cancerous tissue when kept in ray-free conditions. It is concluded that a normal cell becomes permanently transformed into a tumour cell as the result of exposure to the secondary phenomena of cosmic radiation. Although it is not possible to draw definite conclusions in all cases cosmic radiation has been shown to have biological effects; these effects are only rendered perceptible if living specimens are subjected to the intensified action of the secondary processes of radiation such as shower intensified by 1 cm. lead plates at high altitudes above sea-level.—C. HORTON SMITH.

HOLMES, A. D., & JONES, C. P. (1945.) **Effect of sunshine upon the ascorbic acid and riboflavin content of milk.**—*J. Nutrit.* 29. 201–209. 1373

The authors studied the effect of sunshine on the ascorbic acid and riboflavin contents of milk collected in commercial half-pint bottles. The intensity of sunshine was measured with a pyrliometer and varied from 4.8 g. cal. per sq. cm. on a rainy day to 144.6 g. cal. per sq. cm. on a bright day. The temperature of the milk varied considerably depending on the intensity of sunshine, wind and quality of glass of the bottles. After an exposure for two 30- or two 60-min. periods, the ascorbic acid content fell to zero values. Riboflavin was destroyed more slowly, a 10% loss occurring during 60 min. on a rainy day and 85% destruction during exposure to bright sunshine for 120 min.—E. KODICEK.

COLES, J. D. W. A. (1946.) **Overheating and chilling of chickens.**—*Fmg S. Afr.* 21. 477–478. 1374

A short note to warn the poultry farmer of the effect of overheating and chilling baby chicks during rearing, with reference to the differential diagnosis of some of the other conditions causing losses.—J. D. BLAXLAND.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ANON. (1947.) **Food and drink infections. Conference of representatives of local authorities.**—*Brit. med. J.* 18th Oct. 626–627. 1375

There are between 1,500 and 2,000 deaths annually in England and Wales due to bovine tuberculosis, and many deaths of young children from diarrhoea and enteritis may be due to infected milk. Compulsory pasteurization was urged. Food also frequently becomes infected from human sources, *e.g.*, in cooking and preparation and the regulations in force here were very unfavourably compared with those in force in the U.S.A. The number of food poisoning outbreaks reported annually is now about 500, about seven times as many as before the war. The dangerous foods are milk and milk products, cream, synthetic milk, ice cream, custard, jellies, trifle, brawn, pressed beef, stews and sausages. The danger lies in the preparation of the foods beforehand and in leaving them under conditions suitable for bacterial growth, often in a warm kitchen. The importance of a better system of food storage and more refrigeration was emphasized.—J. M. R.

CLARKE, J. O. (1947.) **Determination of filth and extraneous matter in dairy products.**—*Amer. J. publ. Hlth.* 37. 728–732. [Author's summary copied *verbatim*.] 1376

Filth and extraneous matter in milk can be determined easily in the field, and at the present time such tests are widely used both by the industry and regulatory officials on milk for use in manufactured products. Two hundred and seventy-two recent tests performed by inspectors of the Food and Drug Administration show that considerable quantities of milk containing large amounts of filth are received by cheese factories. Sediment test methods for cream used in butter making are available for use in the field and in the laboratory.

Methods have been developed for the determination of filth and extraneous matter in cheese, evaporated milk, skim milk powder, etc. These are laboratory methods designed for use on finished dairy products. The microscopic identification of filth elements is a very important part of any determination of filth and extraneous matter in dairy products.

CASTELO, M. (1946.) **Investigacion de mycobacterium tuberculosis, en las leches pasteurizadas de consumo, de la ciudad de Montevideo. [Examination of the pasteurized milk supplies for the city of Montevideo for *Mycobacterium tuberculosis*.]**—*Bol. mens. Direcc. Ganad., Montevideo.* 29. 615–617. 1377

Of 171 milk samples taken in Montevideo none contained viable tubercle bacilli. This is attributed to the well-controlled pasteurization of the milk. *Cl. welchii* and *Cl. septicus* were present in 6% of the samples.—I. W. JENNINGS.

LILLENGEN, K. (1945.) Förorening av kött, slaktredskap och slaktlokaler med tuberkelbaciller i samband med slakt av nötkreatur med serosatuberkulos. [Pollution of meat, abattoir apparatus and premises with tubercle bacilli due to carcasses with tubercle bacilli on serous surfaces.]—*Svenska Jägareförb. Meddel.* 10. 1-27. [English summary.] Reprinted in *Meddel. Kungl. Veterinärhögsk.* 19. (1945). 1378

The high percentage of carcasses carrying living tubercle bacilli on apparently healthy surfaces and cleavage planes is reported. It is believed that there is much contamination of carcasses at slaughter and it was found that an average of 71% of utensils were contaminated and 100% of wiping cloths. In 68% of cases tubercle bacilli could be isolated from the floor after cold water sluicing.

Contamination of carcasses may be caused by exudate flowing over the surfaces, or caseous material being spread by saws that have sectioned a lesion. Carcasses may become contaminated by scraping the floor, touching infected carcasses and by the contaminated hands of the operatives. More general hygienic measures are counselled.

—A. G. WARREN.

TODD, F. A. (1947.) *Veterinary preventive medicine in civil affairs and military govern-*

ment (G-5) in Northwest Europe from D-Day to V-Day.—*J. Amer. vet. med. Ass.* 110. 209-212. 1379

The aim of the civil veterinary service was to prevent the introduction of such rapidly-spreading diseases as rinderpest and swine-fever; to control less disastrous diseases such as anthrax, and F. & M. disease; to ensure that laws were enforced to safeguard the quality of meat and milk. This could only be achieved with the co-operation of existing civilian veterinary organizations in each country and co-operation was achieved. Examples are given of disease outbreaks, anthrax in Britany, hog cholera in Normandy and swine erysipelas in numerous places throughout both liberated and occupied areas. F. & M. disease was widespread.—P. S. G.

BODDIE, G. F. (1947.) *The correlation of pre-clinical and clinical teaching. I. Medicine and physiology.*—*Vet. Rec.* 59. 553-554. 1380

Desirable features of the correlation of teaching of medicine and physiology are illustrated by considering the examination of the chest in a case of broncho-pneumonia and the investigation of a case of renal disease. If a student has sound knowledge of the pre-clinical sciences, the clinical teacher can encourage him to develop his powers of deductive reasoning when investigating cases. The course in physiology should include consideration of normal processes occurring in domestic animals, and the ways in which deviations from the normal may arise, so that this knowledge may be logically applied in the clinical years, and mere memory work be reduced to a minimum.

—E. COTCHIN.

REPRODUCTION AND REPRODUCTIVE DISORDERS

BONADONNA, T. (1941.) Osservazioni sull'azione del fumo di tabacco sull'attività dei nemaspermii bovini. [The effect of tobacco smoke on cattle spermatozoa.]—*Fecond. artif., Milano.* 3. No. 6. 1-12. 1381

Fumes of tobacco were observed to have a detrimental effect on spermatozoa, thus confirming the necessity for its total prohibition during work on artificial insemination.—R. MACGREGOR.

BONADONNA, T. (1941.) Osservazioni sull'influenza della tintura di jodio sull'attività dei nemaspermii bovini. [The influence of iodine on the activity of the bovine spermatozoa.]—*Fecond. artif., Milano.* 3. No. 5. 1-5, 7-9, 11; No. 6. 13-15, 17. 1382

An attempt was made to overcome the difficulty of maintaining uncontaminated semen. The necessity for prohibition of the use of disinfectants was questioned. Semen was exposed to iodine vapour for 40 min.—2 hrs. and afterwards

sealed in tubes by means of paraffin wax. The motility of the spermatozoa was altered but their fertility was not impaired. Normal foetuses were produced up to 93 hrs. 40 min. after exposure of the spermatozoa to the vapour.—R. MACGREGOR.

BLAKE, T. A. (1945.) *Inheritance of morphological characters in the sperms of cattle.* [Correspondence.]—*Nature, Lond.* 155. 631. 1383

The heads of the spermatozoa of New Zealand Jersey bulls are much narrower than those of Friesians or Shorthorns. The distinction is less marked between those of Jerseys and the Herefords, Angus and Ayrshire. Within the Jersey breed there are lines of descent in which certain morphological types of spermatozoa prevail such as narrow heads, and the "tail turned back past the head", such types being associated with infertility. Some details are given of the cytology of the spermatozoa and the lineage of the bulls,

but no quantitative data on the occurrence of this cell type or of infertility.—T. H. FRENCH.

BERTHELON, M. (1946.) Les anomalies de l'oestrus. [**Anomalies of oestrus.**]—*Cah. Méd. vét.* **16**. 133-148. **1384**

B. classifies the anomalies of the oestrus cycle commonly met with in the domestic animals into four groups:—anoestrus characterized by complete cessation of the ovarian cycle, hypofolliculism ("silent heat") where the ovarian cycle is normal except that oestrous behaviour is absent, hyperoestrus described as prolonged oestrus of normal intensity associated with the development of follicles which fail to rupture and nymphomania. The aetiology, symptoms, diagnosis and treatment of these anomalies are reviewed and discussed. No bibliography is given.—A. T. C.

SCHAETZ, F. (1943.) Ein Beitrag zur Behandlung steriler Stuten. [**Sterility in mares.**]—*Tierärztl. Rdsch.* **49**. 33-35. **1385**

Taking into consideration the results of vaginal and rectal examination, a series of cases of endometritis in sterile working mares could be classified into five groups according to the nature of the fluid flowing back from the uterus after irrigation with warm saline: E_1 (mild catarrhal endometritis), fluid turbid, but free from floccules; E_2 (mild to severe endometritis), numerous floccules present; E_3 (purulent or muco-purulent endometritis); E_4 (pyometra); E_5 (pneumometra).

In mares in groups E_1 or E_2 , treatment was successful in about half the cases, irrespective of the type of organism present; the prognosis was less hopeful in animals over 13 years of age than in younger mares. The prognosis in groups E_3 and E_4 was unfavourable but not always hopeless. The longer the interval after previous foaling before treatment was applied, the smaller were the chances of further pregnancy.

Organisms present included 17 cases of staphylococci, 13 streptococci, 17 coliforms, and 20 diplococci. Treatment was by uterine irrigation, and in most of the successful cases only one irrigation was necessary. The mares were served at the second oestrus following treatment. Some cases showed a tendency to self-healing.

Materials used for uterine irrigation included a commercial colloidal iodine suspension, and when this was in short supply later, a solution prepared by adding to 1 l. of water 7 ml. of a stock solution of "surfen"—an acridine-dye-like preparation—and 3 ml. of tincture of iodine.

—E. COTCHIN.

Low, A. (1947.) The free-martin.—*Vet. J.* **103**. 391-392. **1386**

External characteristics of bovine free-

martins were partly female and partly male, such as undeveloped udder and thick bull-like skin. Microscopic examination of the sex organs showed non-functional seminiferous tubules, and parenchyma testis; the epididymis was lined by hair cells, and the vas deferens traceable to the epididymis. In a freemartin goat there was an enlarged clitoris, the vagina was distended owing to an imperforate vaginal orifice, the vas deferens on either side led to the sex gland and a non-functional ovo-testis. Examination of the placenta when male and female twins had been born of which the female was a freemartin, showed in some cases anastomoses between the circulations of the twins; this observation lends support to the theory that the mixing of blood from the male foetus with that of the female causes a freemartin to be born; however, cases of non-twin freemartins are known and freemartins have occurred in twins when no such anastomoses were observable; thus the problem of the freemartin has still to be solved.
—R. MARSHALL.

ROSEMEIER, W. (1941.) Kasuistische Beiträge zur Geburtshilfe beim Schwein. [**Veterinary notes on parturition in sows.**]—*Inaug. Diss., Hanover*. [Abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* May 28th. 168. (1943).] **1387**

Sows were admitted to the obstetrical clinic for four main reasons:—delayed parturition with infection of the placenta; delayed parturition due to mechanical obstruction; delayed parturition due to mechanical obstruction complicated by vaginal infection and delayed parturition due to weak uterine contractions. The aetiology and treatment of these conditions are discussed.

—ALFRED T. COWIE.

SWAN, C., & TOSTEVIN, A. L. (1946.) Congenital abnormalities in infants following infectious diseases during pregnancy, with special reference to rubella: a third series of cases.—*Med. J. Aust.* May 11th. 645-659. **1388**

The infectious diseases recorded in this report are 40 cases of rubella, observed during pregnancy, and two in the two weeks prior to pregnancy, eight cases of morbilli, three of mumps, two of varicella, two of *herpes zoster*, and one of scarlet fever. No defects were related to the cases of rubella prior to pregnancy. Thirty-seven of the infants whose mothers had rubella during pregnancy (from first to the seventh or eighth months of pregnancy) showed congenital defects. The anomalies follow the pattern described in a previous report [see *V. B.* **17**. 323]. The three cases of maternal rubella in which no defects were observed in the children occurred in pregnancies of two, three and a half and six months' duration.

Two infants whose mothers had morbilli at three and a half and four months pregnant, respectively, exhibited congenital defects (heart disease, pyloric stenosis in one, and *genu valgum* in the other). Six other cases of maternal morbilli unassociated with congenital anomalies in the infants are reported.

One case of maternal mumps at one week pregnant, in which the mother also had bronchiectasis, was seen; the child had a slight capillary naevus on the right upper eyelid. Two other cases of maternal mumps at three weeks and seven months pregnant are recorded, the children exhibiting imperforate anus and microcephaly, respectively.

Varicella affected two mothers at about the seventh month of pregnancy. One child was normal, the other whose mother had "boils in ears" at five months pregnant and heart disease and naevus of the scalp.

Two cases of congenital defects in children

whose mothers were affected with *herpes zoster* at four and six months pregnant, respectively, are reported. The anomalies were, in the first case, deaf mutism and heart disease; in the second, myelocele, bilateral talipes, and right *genu curvatum*.

Obliteration of the bile ducts in one infant whose mother had scarlet fever when seven months pregnant was observed. The child died when five weeks old.

The authors have discussed the geographical distribution, annual incidence and nature of the maternal rubella they observed. Occurrence late in pregnancy of the other maternal infectious diseases observed suggests that, except in the case of mumps, their relationship to the occurrence of congenital defects "was merely fortuitous". STOCKARD's experimental evidence and conclusions, 1920-21, have been used in forming a basis for discussion of the pathogenesis of the anomalies.—D. A. TITCHEN.

ZOOTEC HNY

SEATH, D. M. (1947.) **Heritability of heat tolerance in dairy cattle.**—*J. Dairy Sci.* 30. 137-144. 1389

Observations on heat tolerance as indicated by body temperature and respiration rate were carried out in the hot weather during two years on two dairy herds of Jersey and Holstein cattle.

The records of cows the progeny of different sires were arranged in groups and studied. Eight sires and 68 of their daughters were involved.

The results indicated that inheritance played a part in causing differences in heat tolerance. Body temperature appeared to be a more useful measure of heat tolerance than respiration rate. It was estimated that heritability of body temperature was about 15-30%, that is the offspring of parents selected because of tolerance to heat would be expected to retain from 15-30% of the advantage shown by their parents over the average for the herd.—M. C.

SEATH, D. M., & MILLER, G. D. (1947.) **Effects of shade and sprinkling with water on summer**

comfort of Jersey cows.—*J. Dairy Sci.* 30. 255-261. 1390

The effects of shade and of shade plus sprinkling of the body with water in reducing the temperature and rate of respiration in four Jersey cows was studied after the cows had been exposed to the sun from 12 noon to 2 p.m.

It was found that the sprinkled cows returned to normal temperature and respiration when they were put in the shade more quickly than did those which had not been sprinkled.

The air temperature during the experiments varied from 83° to 90°F. and relative humidity between 61 and 80%.—M. C.

KIDDLE, P. (1947.) **Dehorning of cattle.** [Correspondence.]—*Vet. Rec.* 59. 604. 1391

An electric cautery made by adapting a rawlplug soldering iron which has been devised and used by a farmer in Gloucestershire is described and illustrated. It is claimed to give good results especially when used on calves at the age of one month.—M. C.

REPORT

TRINIDAD AND TOBAGO. (1946.) **Administration report of the Director of Agriculture for the year 1945.** [LEACH, E. W.] pp. 20. Trinidad and Tobago: Govt. Printer. 60c. Items of veterinary interest pp. 4, 19 & 20. 1392

Animals imported for slaughter included 16,547 cattle from Venezuela; 3,623 goats from

British West Indies and 7,109 from Venezuela; 1,700 sheep and 2,742 pigs. Animals imported for breeding or work included 14 goats; four sheep; 82 horses; 172 mules and four donkeys. Seven dogs were also imported.

One case of ANTHRAX occurred in Toco district. There were fewer outbreaks of SWINE

FEVER, crystal violet vaccine being used. Tuberculin tests of cattle mainly owned by peasants in the rural areas around Port-of-Spain showed no reactors. The herd of 480 cattle on the Government Stock Farm, Valsayn, showed 2.5 % reactors. Cases of PARALYTIC RABIES (rat transmitted) occurred in the Mayaro district in the first quarter of the year. Animals were vaccinated and bat destruction units carried out a campaign to reduce the numbers of carriers of the disease. There were no cases of RABIES (ordinary). Imported dogs were placed in quarantine. All unlicensed dogs were destroyed.

No cases of EQUINE ENCEPHALOMYELITIS occurred. Compulsory vaccination has been

imposed by legislation on the Queen's Park Savannah. BOVINE BRUCELLOSIS is being brought under control. Cases of STRANGLES and INFLUENZA were mainly on the sugar estates following the introduction of Kentucky mules from the U.S.A. Overcrowding is said to have been the main contributing cause of losses from CALF PNEUMONIA. Better treatment of wounds has reduced the number of cases of TETANUS. A good deal of loss occurs among young livestock from HELMINTH infestations. Periodic treatment is carried out on many of the larger estates with good results. A scheme to give monthly treatment to the animals of the peasantry is being inaugurated.—J. A. GRIFFITHS.

BOOK REVIEWS

CREW, F. A. E. [M.D., D.Sc., Ph.D., F.R.S., F.R.C.P.Ed. Professor of Public Health & Social Medicine, University of Edinburgh]. (1947.) *Genetics in relation to clinical medicine*. pp. xii + 111. Edinburgh: Oliver & Boyd. 10s. 1393

This book is written for the use of medical students, and the examples used to illustrate the different modes of inheritance are taken from the human subject and not from experimental animals such as drosophila and white mice. The endeavour is to equip the student with genetical knowledge which will be of value to him in interpreting problems which he will encounter in the course of practice and which will enable him to give helpful advice to his patients. It is a model of compression, without loss of lucidity, and the vigorous readable English in which it is written is a welcome contrast to many other textbooks of genetics. The veterinarian will not find reference to genetical conditions in domestic animals, but the practical approach to the study of genetical problems cannot fail to be stimulating and useful.

—M. C.

BASSET, J. [Ancien Professeur de Microbie a l'École Nationale Vétérinaire de Lyon. Professeur honoraire des Écoles Nationales Vétérinaires]. (1946.) *Quelques maladies infectieuses*. [Some infectious diseases.] pp. xxxi + 790. 47 plates. Numerous refs. Paris: Vigot Frères. 1394

This book deals with swine fever, the salmon-

ella and pasteurella infections of domestic animals and similar organisms of man and rodents, swine erysipelas, blackleg, braxy and other anaerobic infections of sheep, anthrax, the virus diseases of horses and fowl pox. It is not a text book, but is a detailed discussion of the nature, diagnosis and methods of control of the various conditions, the conclusions being mainly based on the observations and experimental work of the author, though these are compared with the findings of other workers. The book is not altogether orthodox, the pasteurella of animals, for instance, being considered as strains of a single species *P. veterinaria*. It is also interesting that the virus diseases of horses are divided into three entities, contagious pneumonia, contagious bronchitis or influenza, and "fièvre typhoïde" [pink eye].

After a brief historical note, each condition is dealt with in respect of the identification of the causal agent, the clinical and pathological characteristics, epidemiology, diagnosis and methods of immunization and control. It is on the last aspect that most of the author's own experimental work has been conducted, and the detailed information given on the value of vaccines and antisera, and the time spacing of injections when using double inoculation methods, is remarkably informative. The book shows the author to be a clear thinker who does not easily accept methods or theories which have been put forward on insufficient evidence, and who readily admits when his own search after knowledge has failed to find a conclusion.—U. F. RICHARDSON.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December. Indexing period previous January—June.

No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed. Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly. Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to: Central Sales Branch (Commonwealth Agricultural Bureaux), Agricultural Research Buildings, Penglais, Aberystwyth, Wales.

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

INDIAN JOURNAL OF VETERINARY SCIENCE AND ANIMAL HUSBANDRY

Quarterly

Journal devoted to the publication of scientific research relating to the health, nutrition and breeding of livestock.

Annual subscription Rs.6; per part, Rs.2.

INDIAN JOURNAL OF AGRICULTURAL SCIENCE

Bimonthly

Journal of agriculture and the allied sciences, mainly devoted to the publication of the results of original research and field experiments.

Annual subscription Rs.15; per part Rs.3.

INDIAN FARMING

Monthly Magazine for the Layman

Features of the magazine include *original articles* of practical interest to farmers, *What the scientists are doing*, *What's doing in all India*, *What would you like to know?* etc., of special interest to farmers, landowners, rural development workers, co-operative societies, government officials, clubs, libraries and college students.

Annual subscription Rs. 6; single copy As./8/-.

Manager of Publications, Civil Lines, Delhi

COMMONWEALTH AGRICULTURAL BUREAUX

JOURNALS PUBLISHED BY BUREAUX ON RELATED SUBJECTS

Published by the:—

DAIRY SCIENCE ABSTRACTS	COMMONWEALTH BUREAU OF DAIRY SCIENCE, SHINFIELD.
ANIMAL BREEDING ABSTRACTS	COMMONWEALTH BUREAU OF ANIMAL BREEDING AND GENETICS, EDINBURGH.
HERBAGE ABSTRACTS	COMMONWEALTH BUREAU OF PASTURES AND FIELD CROPS, ABERYSTWYTH.
NUTRITION ABSTRACTS AND REVIEWS	COMMONWEALTH BUREAU OF ANIMAL NUTRITION, ABERDEEN.

Annual subscription to the first three is 25s. (with a special reduction of 20 per cent. for orders received direct from subscribers in Great Britain, the Dominions and Colonies); the annual subscription to Nutrition Abstracts and Reviews is 42s.

RECENT OCCASIONAL PUBLICATIONS ON AGRICULTURE AND FORESTRY

BUREAUX JOINT PUBLICATIONS

No.		Price
9.	The use of aerial survey in forestry and agriculture. Commonwealth Bureaux of Forestry and Pastures and Field Crops, 1946 ...	7s. 6d.
10.	The use and misuse of shrubs and trees as fodder. Bureaux of Pastures and Field Crops, Forestry, and Animal Nutrition, 1946	9s. 0d.
11.	Some British books on agriculture, forestry and related sciences, 1939-45. July, 1946	3s. 0d.
12.	Phenothiazine, a review and bibliography	4s. 0d.

TECHNICAL COMMUNICATIONS, ETC.

Commonwealth Bureau of Animal Health, Weybridge.

Review Series No. 2. Modes of spread of *Streptococcus agalactiae* infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944 3s. 0d.

Commonwealth Bureau of Animal Nutrition, Aberdeen.

15. Minerals in pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944 5s. 0d.

16. Diet in relation to reproduction and the viability of the young. Part 1. Rats and other laboratory animals. August, 1946 3s. 0d.

Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.

The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945 7s. 6d.

Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.

36. The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ... 7s. 6d.

38. Advances in grassland husbandry and fodder production. Second symposium.

Late 1946 6s. 0d.

Commonwealth Bureau of Plant Breeding and Genetics, Cambridge.

The new genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946 6s. 0d.

Commonwealth Bureau of Soil Science, Harpenden.

43. Land classification for land-use planning. June, 1946 4s. 0d.

Commonwealth Mycological Institute, Kew.

An annotated bibliography of medical mycology, 1945. 1946 5s. 0d.

SUBSCRIPTIONS

All correspondence regarding subscriptions to journals and sales of occasional publications should be addressed to, and cheques made payable to:—Central Sales Branch (Commonwealth Agricultural Bureaux), Penglais, Aberystwyth, Wales.